



★
BOOK ABOUT TRAVELLING
PAST AND PRESENT



WILLIAM F. NIMMO,
LONDON AND EDINBURGH

A BOOK
ABOUT TRAVELLING

Past and Present

COMPILED AND EDITED

THOMAS A. CROAL

WITH NUMEROUS ILLUSTRATIONS

WILLIAM P. NIMMO
LONDON AND EDINBURGH

1877

"A people who do not possess the art by which the products of labour and thought, and the persons who labour and think, are transferred from place to place, cannot be said to have emerged from barbarism."—DR. LARDNER.

"As the Spanish proverb says, 'He who would bring home the wealth of the Indies must carry the wealth of the Indies with him,' so it is in travelling; a man must carry knowledge with him, if he would bring home knowledge."—DR. JOHNSON.



PREFACE.

THE writer of the following pages has not attempted to give an exhaustive history of every feature the subject presents for study. It has been his aim simply to produce a series of pictures, sketchy perhaps, in some parts, but fairly accurate, of the modes of travel that have been, or still remain, in use in this country, giving illustrations more or less copious, and generally, in the words of the original narrative, in every branch of the inquiry, with a sufficient reference to authorities, but without presuming to exhaust the available material. With records so abundant the absence of any previous endeavour to give such a history of methods of travelling as is here attempted is notable. M. Ramée, in his excellent *Histoire des Voitures*, remarks that it is truly astonishing that there should not yet exist to-day, in any language, a complete general history of coaches, such as he essayed to sketch in his volume. Similarly the writer may express some surprise that, with material so accessible for the work, it should have been left to him to offer such a general sketch of methods of travelling as is here presented.

The sources from which information has been derived are, as a rule, shown in the text; but the thanks of the writer are due to several persons who have aided him in the endeavour to

treat comprehensively his varied and interesting subject. To the several editors and publishers who permitted extracts to be made from newspapers or books, to some old friends from whom a few unpublished facts and reminiscences have been derived, and to two young friends who aided him in culling information from books, old and new, the thanks of the writer are here cordially tendered.

T. A. C.

June 1877.



CONTENTS.

THE SEDAN CHAIR.

CHAPTER I.

Introduction and Early Use—Horse Litters—Chaises à Porteurs—Men as Beasts of Burden—The Chair of the Seventeenth Century *Pages 19-25*

CHAPTER II.

Sedans in the Eighteenth Century—Chairs an Aristocratic Innovation—Perils of tipsy Chairmen—Nationality of the Chair-Bearers—Chairs at Balls and Assemblies—Chairs for Writing—Chairs for Patients and Prisoners—Fares and Regulations—Form of Chair in Eighteenth Century. 27-36

CHAPTER III.

Modern Chairs—The Chairmen of Edinburgh—Fares and Regulations—Existing examples of Chairs 37-42

CHAPTER IV.

Sedan Chairs in China—Chairs in Japan—The Form of the Jin-riki-sha—How the Jin-riki-sha strikes the stranger—Wheeled Sedans in Europe 43-56

THE COACH

CHAPTER I.

Earliest Notices of Coaches—Etymology of the name—Early use of Coaches in Europe—Opposition to the use of Coaches—Introduction of Coaches into Britain 57-73

CHAPTER II.

Coaches in the Eighteenth Century—Changes of form—Coaches in Scotland—A Coachman's Account for outlays—State of the Roads—Speed of Travelling—Roads in Scotland—The pleasures and dangers of Coach Travelling 75-112

CHAPTER III.

Famous and Sumptuous Coaches—The Korff Berline—Washington's State Coach—Ancient and existing State Carriages—The Lord Mayor's Coach—Royal State Carriages—Oriental State Carriages—An Automaton model Carriage—The Queen's Coronation—The Infernal Machine—Existing specimens of Gaudy Carriages—John Gilpin—Fanciful Coaches—The "Three-Wheeled Chariot"—A Six-Wheeled Carriage—The Char Volant—Prevention of Accidents—The Irish Noddy—Various National Vehicles—The Waggonette—The Perambulator *Pages 113-143*

THE STAGE COACH.

CHAPTER I.

First Records of Stage Coaches—The Stage Waggon—First Stage Coaches in Britain—Pictures of Stage-Coach travel in the Eighteenth Century—A Stage Coach and its occupants *145-153*

CHAPTER II.

Flying Coaches—The Edinburgh "Glass Coach"—Incidents of Stage-Coach travel—Dangers of outside travelling—The "Hawes Fly"—The Derby Dilly—Riding "Bulkin"—The Stage Coach a Microcosm—Love in a Stage Coach—Stage-Coach dangers—Highwaymen—Shot-proof Coaches—A French Stage Coach—Vehicles in Spain . . . *159-180*

CHAPTER III.

Mail Coaches—History of the Post-Office—Mr. Palmer's Mail-Coach reform—Opposition to the Mail Coaches—Increase in number of Coaches—Speed of the Mail Coach—State of the Roads—Cost of the Mail-Coach system—The Coach-building Contract *181-205*

CHAPTER IV.

Personal Reminiscences of Coaching Days—Pleasures of the Mail—Miseries of the Mail—The Outside Passenger—The "Road Game"—The Mail-Coach Driver—The Mail Guard *206-230*

CHAPTER V.

Irish Mails and Mail Coaches—Early years of Charles Bianconi—Origin of the Car system—Extent and Growth of the Cars—Effect of Railways on the Cars—The Car Drivers *231-243*

CHAPTER VI.

Inns and Hotels—The Tabard at Southwark—Various characters of old Inns—Effects of improved Coaching—Irish Hotels—Greater cost of Modern Hotels—The Grumbling Traveller—The law as regards Inns—The Revival of Coaching—History of the Revival—The Four-in-Hand Club—The Coaching Club—The Scarborough and Bridlington Coach—The Strathpeffer Coach *244-271*

THE CANAL.

CHAPTER I.

Historical Notices of Canals—Canals in China—Invention of the Canal Lock—Earliest Modern Canals in Europe—Canals of Britain—Remains of Roman Canals in Britain—Early proposals for Canals—James Brindley—Brindley's first Canal—Further enterprises—Canal Tunnels—Canals in Scotland and Ireland Pages 272-301

CHAPTER II.

Results of Canal enterprise—A Canal Journey—Speed of the Journey—Amenities of Canal travelling—Canal Scenery—Dangers of Canal travelling—Existing Passenger Barges 302-319

CHAPTER III.

Ship Canals—The Caledonian Canal—The Forth and Clyde Canal—Canals in Holland—French Ship Canals—The Suez Canal 320-342

THE STEAMER.

CHAPTER I.

Travelling by Water—The River Hoy—First essays in Steam Navigation—Continental Inventors—Miller and Symington 343-361

CHAPTER II.

Paddle Steamers—The first American Steamer—The "Comet"—The Hull and Engine sixty years after—Spread of Steam Navigation—The first Sea-going Steamer—First attempt at deep-sea Steam Navigation—Spread of Steam Navigation—Public estimate of Steamers 362-385

CHAPTER III.

Ocean Steamers—The first Atlantic Steamer—The 'Great Western' and 'Sirius'—The 'Great Britain'—Experiments in form and size—The 'Great Eastern'—General progress of Steam Navigation—Iron-clad War-Steamers—First Iron Boat at Sea—Steamers in Commerce—The Overland Route—The Royal Mail Steam Packet Company—The Cunard Company—Speed and Route on the Atlantic—Changes in form of Marine Engines—Saving in Fuel 386-425

CHAPTER IV.

The Pleasures and Dangers of Steam Navigation—"Across the Atlantic"—Perils of the Ocean—Terrible Atlantic Voyages—the Forfarshire and Grace Darling—The Birkenhead—American River Steamers 427-451

THE RAILWAY.

CHAPTER I.

When were Railways first made?—Railways two centuries ago—Various forms of Rail—First Projectors of Passenger Railways—The earliest Locomotive—Rapid travelling—Railway Acts before 1825—The Stockton and Darlington—How the Act was obtained—George Stephenson and Edward Pease—Opening of the first Railway—First Locomotive Railways in Scotland—The Canterbury and Whitstable—The Liverpool and Manchester Line—The Locomotive Competition—Opening of the Line—The first Railway Accident *Pages 453-486*

CHAPTER II.

Public opinion on Railways—Objections to Railways—Practical forms of Objection—Opposition in the Press—Opposition from Canal Proprietors—Early opinion in favour of Railways—Charles Maclaren on Railways—Realisation of Mr. Maclaren's speculations—Favourable impressions of the Railway—Growth in public favour 487-511

CHAPTER III.

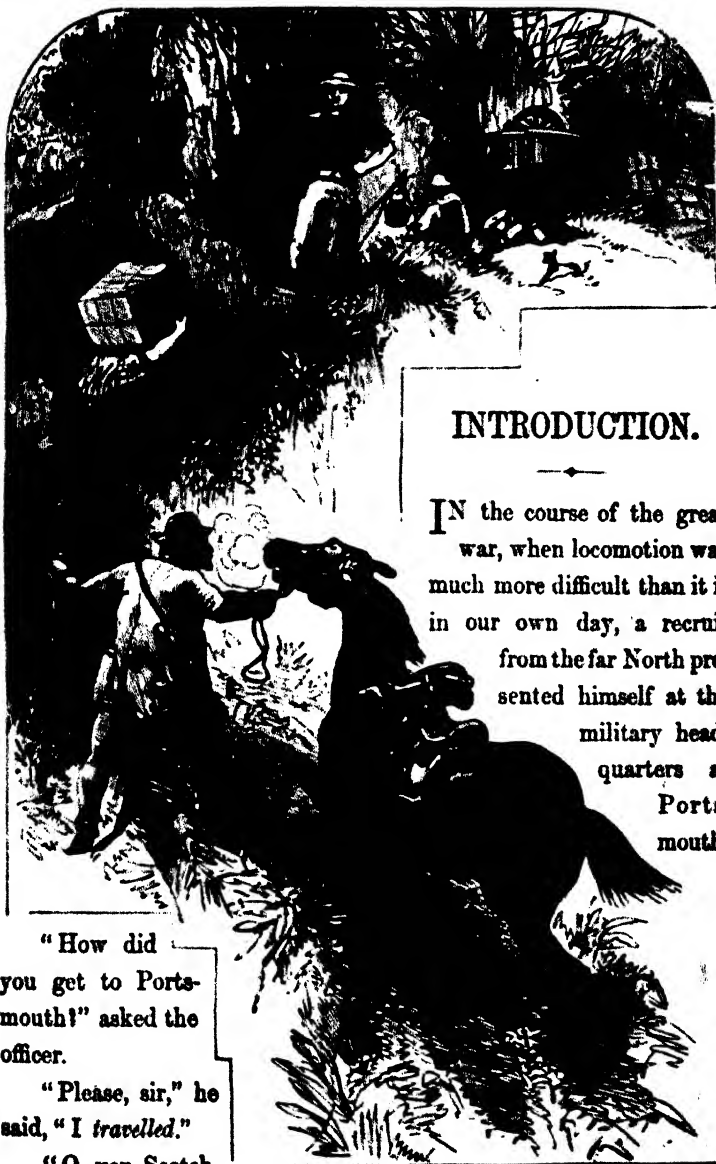
Remarkable Railway Works—The Chat Moss—Bridge at Chepstow—The Thames Tunnel—The Euston Station—The Kilsby and Watford Tunnels—The Britannia Bridge—The South Devon Viaducts—The Niagara Suspension Bridge—The Victoria Bridge, St. Lawrence—The Mont Cenis Tunnel—The Channel Tunnel—Trestle Bridges in America—The Tay Bridge 512-551

CHAPTER IV.

Spread of the Railway system—Growth in the United Kingdom—Traffic and Revenue—Railways in the British Empire—Railways in India—A Railway to India—Railways in Canada—The Railways of the World—Railways in the Far East 552-578

CHAPTER V.

Some special features of Railways—Speed on the Railway—Refreshment Rooms—Sumptuous travelling—Accidents on Railways—Railway Servants—The Station-master—The Booking-Clerk—The Porter—Platelayer and Signalman—Engine-Driver and Guard 579-606



INTRODUCTION.

IN the course of the great war, when locomotion was much more difficult than it is in our own day, a recruit from the far North presented himself at the military headquarters at Portsmouth.

"How did you get to Portsmouth?" asked the officer.

"Please, sir," he said, "I travelled."

"O you Scotchman!" rejoined his interrogator.

What appeared to the English officer as an archaic and barbarous use of the word was nevertheless at one time its ordinary meaning, and it is still occasionally used in that limited sense. Lord Palmerston perhaps did not, as many persons suppose, fail in his usual felicity when he said no more to Colonel Grant (of the Nile) than "You have had a long walk"—a remark which resulted in the book which followed being called *A Walk across Africa*—for the genial peer thus distinguished Grant as one of the greatest "travellers" of his day.

Shakespeare affords many examples of this use of the word. Thus Antipholus of Syracuse, in the *Comedy of Errors*, says, "With long travel I am stiff and weary." Rosalind, in *As You Like It*, says of Celia in the Forest of Arden, "Here's a young maid with travel much oppressed;" and in the First Part of *King Henry IV.*, we have Prince Henry's order to Falstaff, "Lay thine ear close to the ground, and list if thou canst hear the tread of travellers." Again, "You are a vagabond and no true traveller," says Lafeu to Parolles, in *All's Well that Ends Well*.

But if the word could be only used in such a sense, Man as an animal would have really nothing to distinguish him, as regards powers of locomotion, from the lower creation. In many respects he would be indeed inferior, for the speed and endurance of the horse, the flight of the eagle, "the way of a fish in the sea" far excel man's individual powers of locomotion.

If then, following in the wake of the philosopher, we try to fix a distinguishing epithet on Man, and call him "a travelling animal," we must mean an animal who uses either his fellow men, or the lower animals, or scientific and mechanical aids, to favour his desire to move easily from place to place. It is true, there are some animals other than man who have sought to use what seem like adventitious aids to their locomotion. The spider spins the aerial thread by which he travels, while the nautilus spreads his sail to catch the breeze, and urge his frail shell over the bounding water. And we have the traveller's story of a body of monkeys, who made a "swing bridge" of their bodies whereby to pass an otherwise impassable stream, holding on to each other's tails, and swaying to and fro till a tree on the other side was caught by the lowest link of this living chain. Man, however, in seeking to travel, finds himself, so far as the last example is concerned, in the position of the old Scotch woman mentioned by Dean Ramsay, whose physician

assured her that since he had allowed his beard to grow he had never suffered from sore throat, of which she complained :—"Ye ken, Doctor, that's a cure that I canna follow."

Man being neither a spider nor a nautilus nor a monkey, he has sought other methods to supplement, artificially, those implements of locomotion bestowed upon him by nature. Evidence of this is found from the earliest ages. In the pages of the Bible the references to walking are as remarkably scanty as those to riding on camels, horses, asses, etc., are numerous, and we have also many references to ships, both of commerce and of pleasure. Highways and byeways are both mentioned in the song of Deborah and Barak (Judges v.), and in such a way as to suggest the possession of good roads. Several centuries later, when the first mention of sending letters by post is found—namely in the romantic story of Queen Esther and her people—we read of "posts on horseback, and riders on mules, camels, and young dromedaries ;" those on mules and camels being specially named for their speed, "being hastened and pressed on by the king's commandment." Hospitality to the traveller, whether to a "wayfaring man" or to one advancing in greater state, was in early times, as it still is in the East, a duty ; and while in the story of the Levite and the old man of Gibeah we have a tacit rebuke of those who neglected this duty, it is one of the subjects on which Job congratulates himself, that, amongst other good works, he had "opened his door to the traveller." As regards progress on the water, the most conspicuous reference to vessels, in the older Scriptures, is probably that in Isaiah xxxiii., where we read of "a place of broad rivers and streams ; wherein shall go no galley with oars, neither shall gallant ship pass thereby ;" while the stirring and detailed description of the voyage and shipwreck of St. Paul gives a fine conception of the state of navigation in his day.

In the making of roads the Romans were conspicuous labourers, a familiar illustration of this being the "Appian Way"—also associated with the journey of St. Paul to Rome—which was made by Appius Claudius about the year 310 B.C. *Procopius, who wrote in the sixth century, thus describes it:—*"To traverse the Appian Way is a distance of five days' journey for a good walker, and it leads from Rome to Capua ; its breadth is such that two chariots may meet upon it and pass

each other without interruption ; and its magnificence surpasses that of all other roads. For constructing this great work Appius caused the materials to be fetched from a great distance, so as to have all the stones hard and of the nature of millstones, such as are not to be found in this part of the country. Having ordered this material to be smoothed and polished, the stones were cut in corresponding angles, so as to fit together in joinings without the intervention of copper or any other material to bind them, and in this manner they were so firmly united, that in looking at them one would say they had not been put together by art, but had grown so upon the spot ; and notwithstanding the wear of so many ages—being traversed daily by a multitude of vehicles and all sorts of cattle—they still remain unmoved ; nor can the least trace of ruin or waste be observed upon these stones, neither do they appear to have lost any of their beautiful polish ; and such is the Appian Way."

To this day, after a lapse of two thousand years, the Appian Way still presents itself as a fine road, and remains of Roman roads are common over most of Europe. As regards the speed with which travelling was accomplished in that age, it is recorded that Cicero on one occasion received at Rome, on the 28th of September, a letter dated in Britain on the first of the month—a wonderful feat when we consider the passage by sea and the crossing of the Alps, or the troublesome circuit necessary in order to avoid the latter. An instance of rapid travelling is given by Gibbon, who states that Cesarius, a magistrate of rank in the time of Theodosius, went post from Antioch to Constantinople. He began his journey at night, was in Cappadocia, 165 miles from Antioch, the ensuing evening, and arrived at Constantinople the sixth day about noon, the distance being 725 Roman or 665 English miles.

Although such a feat was possible in the fourth or fifth century, the mists of the dark ages fell on the world, and when modern history opens on our own country, the art of travelling was so low—the roads being practically non-existent, the construction and use of vehicles being so rare, and inter-communication between distant places so difficult—that we may be disposed to agree with Dr. Lardner, that a more adequate idea of the state of locomotion in our times will be conveyed by calling it a new art than by describing it as an improvement on an old one. The same writer remarks, in regard to the

progress in this art, that "within a hundred years more has been accomplished in facilitating and expediting inter-communication than was effected from the creation of the world to the middle of last century." It is the design of this work to illustrate the history of the hundred years here referred to. The divisions of the volume into the Sedan, the Coach, the Canal, the Steamboat, and the Railway, might not inaccurately have been measured off into periods of quarter of a century. It might have been found roughly accurate to place the culminating point of the Sedan Chair in 1775, the development of the Stage Coach in 1800, of the Canal in 1825, of the Steamboat in 1850, and of the Railway in 1875. In that century of travel—or rather of modes of travel—few can have any conception how much is comprised, unless they have dived into the literature of the subject. The succeeding pages will be found but to skim the surface, giving an insight into the past and present condition of the art of locomotion, which, while it may suffice for the student who merely seeks to gain a general knowledge of the subject, may at the same time serve as a whet to the appetite of any one who desires to learn more than is here recorded. The generation is rapidly passing away to whom all the methods of travelling described in this volume have been familiar; but if any reader of this book should be one who has journeyed by the less rapid and less convenient methods here noticed, he will doubtless be inclined to echo the saying of the Rev. Sydney Smith, in his old age, that he was ashamed that he had not been more discontented, and utterly surprised that all these changes and inventions did not occur two centuries ago. Although a century is named, the story might be compressed into a period considerably less than the century. The writer of these words, who is still some years "on the right side of fifty," has seen sedan chairs placed for hire on the streets of Edinburgh; he has seen friends arrive or depart by the "swift boat" on the Union Canal; he has travelled by the slow paddle-steamer as well as by the swifter vessels of a later day; and while he has enjoyed in youth a day's excursion on the "Innocent Railway," between Edinburgh and Dalkeith, and travelled on the Dundee and Arbroath line while it was yet on the broad gauge, and was the only important locomotive line in Scotland, he has also done the marvellous nine hours' journey from London to Edinburgh in the "Flying Scotchman." These experiences have convinced

him that Sydney Smith took a right view of the subject when explaining his experiences in travelling:—

The good of ancient times let others state,
I think it lucky I was born so late!

The question may be asked, Is there any finality in the progress of the art of locomotion? Its history in the past fifty years has been a succession of surprises, and it would be too much to venture on the assertion that no more surprises are in store for us or our successors. The vast and attractive subject of balloon-voyaging has not been treated in this volume, neither has the writer ventured to peer into the regions of the unknown in the hope of descrying what form of travelling—electric, aerial, or whatever it may be—is to replace the railway system, when it, too, becomes old and like to vanish away. But it is not to be concluded, because we consider sixty miles an hour a marvellous speed, that no higher velocity in travelling is possible. Progress will probably be made in the future as progress has been made in the past; and just as twelve miles an hour seemed a breakneck speed to a generation accustomed to jog on at a speed of three or four, so the time may come when the people who deem sixty miles an hour the acme of time-annihilation, will laugh at or virulently oppose some proposed method of travelling to which the speed of an express railway train will seem but the progress of a snail. In the arguments which have been frequently held on the question whether the railways of this country should not be put under State control, the probability of railways being superseded has been gravely advanced as a reason for opposing the proposition. We may agree with the *Times* in believing that the advent of that time is remote, and that the railway will last so long, as our principal means of internal communication, as to remove the anticipation of a change from the region of argument. Yet he would be a bold man who would assert that this must be so. The world may be nearer than it imagines to the realisation of Hugh Miller's "Vision of the Railroad." That vision, it is true, pictured the decay of the railway as arising from the neglect of the obligation of the Sabbath rest, and not, as did some of the opponents of railways forty years ago, because it was too rapid and costly, or, as the prophets of improvement in travelling now hint, because it will become too slow and too costly. The picture

Hugh Miller has drawn, from his point of view, and which opponents of the London and Birmingham Railway also drew because they imagined the scheme would be a failure (see page 492), may yet be realised, when a more wonderful method of travelling has been discovered.

"Under the gloomy sky of a stormy evening," writes Hugh Miller, "I could mark on the one hand the dark blue of the Pentlands, and on the other the lower slopes of Corstorphine. Arthur's Seat rose dim in the distance behind; and in front, the pastoral valley of Wester Lothian stretched away mile beyond mile, with its long rectilinear mound running through the midst,—from where I stood beside one of the massier viaducts that rose an hundred feet overhead, till where the huge bulk seemed diminished to a slender thread on the far edge of the horizon.

"It seemed as if years had passed—many years. . . . All around was solitary, as in the wastes of Skye. The long rectilinear mound seemed shaggy with gorse and thorn, that rose against the sides, and intertwined their prickly branches atop. The sloe-thorn, and the furze, and the bramble choked up the rails. The fox rustled in the brake; and where his track had opened up a way through the fern, I could see the red and corroded bars stretching idly across. There was a viaduct beside me: the flawed and shattered masonry had exchanged its raw hues for a crust of lichens; one of the taller piers, undermined by the stream, had drawn two of the arches along with it, and lay adown the water-course a shapeless mass of ruin, o'ermastered by flags and rushes. A huge ivy, that had taken root under a neighbouring pier, threw up its long pendulous shoots over the summit. I ascended to the top. Half-buried in furze and sloe-thorn, there rested on the rails what had once been a train of carriages; the engine ahead lay scattered in fragments, the effect of some disastrous explosion, and damp, and mould, and rottenness had done their work on the vehicles behind. Some had already fallen to pieces, so that their places could be no longer traced in the thicket that had grown up around them; others stood comparatively entire, but their bleached and shrivelled panels rattled to the wind, and the mushroom and the fungus sprouted from between their joints."



THE SEDAN CHAIR—SEVENTEENTH CENTURY.



THE SEDAN CHAIR.

CHAPTER I.

I love sedans, cause they do plod
And amble everywhere,
Which prancers are with leather shod,
And ne'ere disturb the care.
Heigh doune, derry derry doune,
With the hackney coaches doune,
Their jumping make
The pavement shake,
Their noise doth mad the tounne.
COLLIER'S Roxburgh Ballad.

INTRODUCTION AND EARLY USE—HORSE LITTERS—CHAIRES À PORT-
TEURS—MEN AS BEASTS OF BURDEN—THE CHAIR OF THE SEVEN-
TEENTH CENTURY.

INTRODUCTION AND EARLY USE.

"CONSTRUCTED to carry one in-
side," the sedan chair appears
to be the least social of all modes
of travelling. From this we need
not exclude riding on horseback,
because in writing "about travel-
ling" we propose to limit our
notes to artificial or mechanical
means, so that both "shank's mare"
and the veritable quadruped are
excluded; and secondly, because
equestrian travelling is essentially
social in its character. To prove
this it is not necessary to go back
to the time when stout horses
carried double, when madam took
her seat behind John the groom
upon a pillion, and when the
strap that is still *de rigueur* in
a groom's livery, had its use in
actual life. No,—horse exercise

is essentially sociable in its char-
acter. Who, for example, ever
read one of G. P. R. James' novels,
in which "two horsemen" were
not depicted as travelling together,
and who that ever owned a horse
did not feel that in the living
companionship of his horse there
was society even though human
companion he had none?

With the sedan chair the case
was different. It was a solitary,
unsocial mode of procedure, and
when we read, in Gay's *Trivia*, of
those who,

Boxed within the chair, condemn the
street,
And trust their safety to another's
feet,

we feel that the person within
and the persons without were

literally "wide as the poles asunder," so far as any idea of society or companionship was concerned. One of the few instances in which we remember to have encountered a sedan chair that carried double is in a memorable scene in *Pickwick*, where we read of an old inn-yard where stood an old sedan chair, which "having been originally built for a gouty gentleman with funded property, would hold Mr. Pickwick and Mr. Tupman at least as comfortably as a modern post-chaise," and in which they were accordingly carried in triumph before the Ipswich magistrate. But the exception only serves to strengthen the rule.

Unsocial as they were, sedan chairs were in great favour in society, and one almost regrets the loss of a means of reaching rout, assembly, or ball, which enabled the splendidly attired beaux and belles of an earlier age to arrive at the scene of their enjoyment unruffled in plumage, and which had this great advantage over the cabs and carriages to which we are now compelled to trust, that the traveller could enter the chair under cover, in his own lobby, before the door was opened to let in the rush of wintry air, and could in the same way be set down within the vestibule of the place of meeting. Unsocial in themselves, they were, nevertheless, the encouragement to sociality in others. Judging from the few specimens of the old chairs which museums or old mansions have preserved to us,

they were an exceedingly comfortable and even dignified means of travelling, and one may heave a sigh of regret that modern improvement and the progress of the age have numbered them with the things that were.

For a period of nearly two centuries and a half the sedan chair held a prominent position amongst the limited modes of conveyance known up to the end of last century. At the beginning of the hundred years more specially dealt with in this volume—that is to say, about 1775—the sedan was probably at its height in point of public usefulness, and it gradually fell off before more perfect, or at least more pretentious, means of conveyance, till it is now only to be found in our museums, or fondly remembered by the older people amongst us as a thing with which they were familiar in youth.

The records differ somewhat as to the exact period when the sedan was first seen in Britain, and a reconciliation of the conflicting dates may perhaps be sought in the fact that at one period they were brought here as a curiosity or luxury, while later they were re-introduced for more general use.

HORSE LITTERS.

Although the histories generally place the introduction of chairs into this country about the end of the sixteenth century, it is a question whether the horse litters used at an earlier period do not

deserve to be reckoned as the real parent of the humanly-borne "Sedan." The old records are filled with notices of horse litters, and of this an example may be found in a letter addressed to the Archbishop of Canterbury, the Bishop of York and Durham, and the High Treasurer, dated July 13th, 10th year of the reign of Henry VI. The King says—"And because we suppose the Queen Joan will soon remove from the place where she is now, that ye ordain her also horses for two *chares*, and let her remove thence into whatever place within our realm that she list." And in confirmation of the use of chairs borne by horses at this date we have the following in *King Henry VI.* :—

La Pucelle.—What will you do, good greybeard!—break a lance,
And run a tilt with death within a chair!

The stage direction given by Shakespeare is, "Bedford brought in sick in a chair." Earlier still, is the following reference in *King Lear* :—

"There is a litter; lay him in't and drive toward Dover, friend!

"Before treating of wheeled carriages," says Mr. Markland, in Vol. xx. of *Archæologia*, "we may notice a mode of conveyance which was long used, especially by females of rank, on occasions of ceremony, and by the rich. This was the horse-litter, of which mention is made at very early periods of our history, and which was unquestionably imported from the luxurious climes of the south. It was also employed in carrying

the dead. William of Malmesbury tells us that the body of William Rufus was placed upon a *rheda caballaria*, a kind of horse chariot, or as Fabian translates it, horse litter; and King John (according to Matthew of Westminster) was conveyed from Swinhead in *lectica equestri* (i.e. the horse litter.) This custom originated in Bithynia, and was introduced at Rome, where the litter was borne by slaves. In the account given of the reception of Katherine of Spain in London, when she came over to marry Prince Arthur in 1501, we find them coupled with *Chares*: whether the latter were covered or not, or in what respect they differed from the litter, does not appear."

The use of the litter as a *state carriage* continued till the time of Charles the First. Mary de Medicis, the queen-mother of France, on visiting her daughter, Queen Henrietta, in 1638, entered London in a litter embroidered with gold and carried by two mules, having previously travelled from Harwich in a coach.

At the coronation of Henry VIII. on 22d June 1509, Queen Katherine is described as "sitting in hir litter, borne by two white palfries, the litter covered and richlie apparelled, and the palfries trapped in white cloth of gold; hir person apparelled in white satin, embroidered, hir haire hanging down to hir backe, beautifull and goodlie to behold, and on hir head a coronall set with manie rich orient stones."

CHAISES À PORTEURS.

Coming, however, to the chair borne by men, to which alone the name of "Sedan" is given, the earliest introduction of them is thus recorded by Andrew Wilson in his *Life and Times of King James the First*, published in 1653 :—

"Every new thing the People disaffect they stumble at, sometimes, at the action for the person, which rises like a little cloud but soon vanishes. So after, when *Buckingham* came to be carried in a Chair, upon Men's shoulders, the clamour and noise of it was so extravagant that the People would rail on him in the Streets, loathing that Men should be brought to as servile a condition as Horses. So irksome is every little new impression that breaks an old Custom and rubs and grates against the public humour. But when Time had made these Chairs common, every loose Minion used them, so that that which got at first so much scandal was the means to convey those privately to such places where they might give much more. Just like long hair, at one time decried as abominable, at another time approved as beautiful. So various are the fancies of the times !"

The duke may probably have offended the London roughs by using a sedan-chair, but he certainly was not the first to introduce it into England, as we find it spoken of as far back as 1581. It was introduced into France in

1617 by M. de Montbrun, and called *chaises d porteurs*.

Evelyn, on the other hand, ascribes their introduction to an English physician. Writing from Naples, he says :—"They greatly affect the Spanish gravity in their habit, delight in good horses ; the streets are full of gallants on horseback, in coaches and sedans from hence brought first into England by Sir Sanders Duncombe." This gentleman, as we learn from another entry in the diary, was possessor of a "celebrated and famous powder," and as already hinted, his recommendation of the chairs for use in this country may have been made in the interests of invalids, to whom this mode of conveyance was very suitable—so suitable indeed that many for this reason alone regret the entire disappearance of the sedan chair. This Sir Sanders Duncombe represented to King Charles that "in many parts beyond sea people are much carried in chairs that are covered, whereby few coaches are used among them," an antagonism between coach and chair which we shall have frequent occasion to notice ; and he prayed for the privilege of introducing such vehicles into this country. Duncombe was patronised by Buckingham, then high in favour, and he obtained the privilege for fourteen years of hiring out sedan chairs, the patent declaring that the lives and limbs of his majesty's subjects were greatly endangered by the multitude of coaches in

London and Westminster, and that the chairs would be a proper substitute. We may not improperly concede to his patron the merit of introducing chairs as for private use, and to Duncombe the honour of being the first to hire out hackney chairs. In 1634, ten years earlier than the remark quoted from Evelyn, Garrard in a letter to Lord Strafford says, "Here is also another project for carrying people up and down in close chairs, for the sole doing whereof Sir Sander Duncombe, a traveller, now a pensioner, hath obtained a patent from the king, and hath forty or fifty making ready for use."

MEN AS BEASTS OF BURDEN.

The objection to making one's fellow-men beasts of burden, probably accelerated the disuse of the chair as a mode of conveyance. Actuated by the same feeling which caused the people to rail on Buckingham, the Scotch judge, Lord Monboddo, refused to employ a sedan chair, though it is said that in wet weather he would hire one to carry home his wig.

This objection is not, it may be remarked, strange to modern travellers. Madame Ida Pfeiffer, the enterprising German lady who travelled round the world, says:—"I was overpowered by feelings of the most disagreeable kind the first time I used a palanquin. I could not help feeling how degrading it was to human beings to employ them as beasts of burden." Some expressions to

the same effect are to be found in the *American Researches* of Humboldt. In traversing the Quindin Pass of the Cordilleras he describes, in the following words, the case of men who act directly, and not indirectly through sedan or palanquin, as beasts of burden.

"As few persons in easy circumstances travel on foot in the climate through roads so difficult, during fifteen or twenty days together they are carried by men on a chair, tied on their back; for in the present state of the passage of Quindin it would be impossible to go on mules. They talk in this country of going on a man's back (*andar en carguero*), as we mention going on horseback; no humiliating idea is annexed to the trade of *cargueros*, and the men who follow this occupation are not Indians but mulattoes, and sometimes even whites. It is often curious to hear those men, with scarcely any covering and following a profession which we should consider so disgraceful, quarrelling in the midst of a forest because one has refused the other, who pretends to have a whiter skin, the pompous title of *don* or of *su merced*. The usual load of a *carguero* is six or seven arrobas (165 to 195 pounds English); those who are very strong carry as much as nine arrobas.

"There is a man of the province of Antisquia who is so bulky that he has not met with more than two mulattoes capable of carrying him, and if either of the men had died while he was on the banks of the Magdalena he never could

have reached his home ! yet so considerable is the number of young men who undertake the employment, that travellers sometimes meet a file of fifty or sixty of them together.

"When we reflect on the enormous fatigue to which those miserable men are exposed, journeying eight or nine miles a day over a mountainous country ; when we know that their backs are some-



times as raw as those of beasts of burden, and that travellers have often the cruelty to leave them in the forest when they fall sick ; we are at a loss to conceive how this employment of a *carguero*, one of the most painful that can be undertaken by man, is eagerly em-

braced by all the robust young men who live at the foot of the mountains." In "*Coryat's Crudities*," quoted by Mr. Markland in *Archæologia*, is a figure of two women carrying a third upon a litter, on their shoulders, over a mountain road.

A somewhat similar feeling probably prompted the remark on Lord Carlisle's well-known letter to George Selwyn, in which he says, "You get up at nine, play with your dog till twelve, then creep down to White's, are five hours at table; sleep till supper-time, and then make two wretches carry you in a sedan chair, with three pints of claret in you, three miles for a shilling."

"Thank God!" says the American novelist, J. Fenimore Cooper, when, in his *Sketches of English Society*, he chronicles the end of sedan chairs, "men have ceased to be horses; when will the metamorphosis be completed by their relinquishing the affinity to the other quadruped!"

THE CHAIR OF THE SEVENTEENTH CENTURY.

The form of the chair as illustrated and described in a pamphlet of 1636, is shown in our first illustration. This pamphlet, "printed by Robert Raworth, for John Crooch," is entitled, *Coach and Sedan pleasantly disputing for place and precedence, the Brewer's Cart being Moderator*, and the cut shows that, if the three chairs said to have been brought home by Prince Charles were borne upon men's shoulders, as some think, this mode of bearing the chair was speedily exchanged for hand-poles, which remained in use as long as the chair existed.





SEDAN CHAIR—EIGHTEENTH CENTURY.



CHAPTER II.

At White's the harnessed chairman idly stands,
And swings around his waist his tingling hands.

GAY'S *Trivia*, ii. 35, 36.

SEDANS IN THE EIGHTEENTH CENTURY—CHAIRS AN ARISTOCRATIC INNOVATION—CHARACTER OF THE CHAIRMEN—CHAIRS AT BALLS AND ASSEMBLIES—CHAIRS FOR WRITING—CHAIRS FOR PATIENTS AND PRISONERS—FARES AND REGULATIONS—FORM OF CHAIR IN EIGHTEENTH CENTURY.

SEDANS IN THE EIGHTEENTH CENTURY.

A VERY cursory examination of the histories, memoirs, letters, and novels of last century is sufficient to show how very largely then bulked in the eyes of the world those convenient and suitable chairs, whose earlier use in this country has been described in the preceding chapter. We encounter them everywhere. Their usefulness, their interference with the rights of foot-passengers, the rapacity of the bearers, the suitability of chairs for public use, the rows and scuffles between chairmen and coachmen (the latter envious of the favour in which their rivals stood), or combats between the fast youths of the time and the sturdy Irishmen who chiefly acted as chairmen;—these could find much more copious illustration than the limits of this work permit. It may, however, be interesting to glance back at the earlier years of the century, and trace to what

extent the public found use for or appreciation of sedan chairs. The condition of the streets went far to recommend the chairs, not only to those within but to those without, in preference to the hackney-coaches of the period. Sir William Davenant has an allusion to the hackney-coaches of his time as "so uneasily hung and so narrow that he took them for sedans upon wheels." At the time we now treat of, carriages were quite as badly hung, and the streets were so rough and ill-paved that the jolting of the miserable hackney-carriages was terrible. To the pedestrian, the carriages presented two very serious defects, namely their noise and the way they splashed the mud about as they rattled along.

OBJECTIONS OF PEDESTRIANS TO CHAIRS AND COACHES.

In the lively picture of the

streets of London, by John Gay, there are constant references to those annoyances. In his *Trivia* he is the professed advocate of pedestrianism, and to his eyes the inventions of coach and chair are alike objectionable :—

In gilded chariots while they loll at ease,
And lazily insure a life's disease ;
While softer chairs the tawdry load convey
To court, to *White's*, assemblies, or the play,
Rosy-complexioned health thy steps attends,
And exercise thy lasting youth defends.

But, though in favour of walking, his historic muse proceeds to describe the modes of progression used in London, even if, before entering on the task, he must exclaim :—

Nor shall the muse thro' narrow Venice stray,
Where gondolas their painted oars display.
O happy streets, to rumbling wheels unknown,
No carts, no coaches, shake the floating town.
Thus was of old Britannia's cities blessed
E'er pride and luxury her sons possessed ;
Coaches and chariots yet unfashioned lay,
Nor late invented chairs perplexed the way.

The poet of travel is very severe upon the chairmen for encroaching upon the privileges of the city pedestrian, and more than once he recurs to the subject. Even where he can escape the noise of the chariots, under the infliction of which he is moved to

apostrophise as above the water ways of the Queen of the Adriatic, he finds his privileges encroached upon by the bearers of sedan chairs :—

O bear me to the paths of fair Pall Mall ;
Safe are thy pavements, grateful is thy smell ;
At distance rolls along the gilded coach,
Nor sturdy carmen on thy walks approach,
No lets would bar thy ways were chairs denied,
The soft supports of laziness and pride.

And when, in the third book of his *Trivia*, he again treats of the town he finds the encroachments of the chairmen still adding a new misery to the unfortunate foot-passenger. From the following lines we can gather an admirable conception of the state of the streets, the limits within which foot-passengers had (or believed they had) the exclusive use, and the way the privileges were disregarded by the sturdy chairmen :—

Let not the chairman, with assuming stride,
Press near the wall, and rudely thrust thy side ;
The laws have set him bounds ; his servile feet
Should ne'er encroach where posts defend the street.

Gay does not, however, consider himself altogether without remedy in such a case, as from the following lines it may be gathered that the *argumentum baculinum* might sometimes secure what the law and the police of the day failed to effect :—

If the strong cane support thy walking
hand,
Chairmen no longer shall the wall com-
mand,
Ev'n sturdy carmen shall thy nod obey,
And rattling coaches stop to make thee
way.

CHAIRS AN ARISTOCRATIC INNO- VATION.

Gay only complains of interferences with his comfort or his progress; and while convinced that walking is the best, he is content with satirising those who took a different view, and spent their wealth on "gilded chariots" or "softer chairs." Others, however, looked on chairs as a direct reproach to those who did not employ them; and the amusing proposal was made to put a tax upon the "slaves of the rich" who elbow them out of the roadway. From the *Tatler* (No. 144) we extract the following "counterblast" against sedan chairs:—

"In spite of all Order, Justice, and Decorum, we, the greater Number of the Queen's loyal Subjects, for no Reason in the World, but because we want money, do not share alike in the Division of her Majesty's High Road. The Horses and Slaves of the Rich take up the whole Street, while we Peripateticks are very glad to watch an Opportunity to whisk across a Passage, very thankful that we are not run over by a Machine that carries in it a Person neither more handsome, wise, or valiant than the meanest of us. For this reason, were we to propose a tax, it should certainly

be upon Coaches and Chairs; For no Man living can assign a Reason why one Man should have half a Street to carry him at his ease, and perhaps only in Pursuit of Pleasure, when as good a Man as himself wants Room for his own Person to pass upon the most necessary and urgent occasion."

But if the pedestrian found the "harnessed chairman" in some respects obnoxious, our poet is not above discovering some compensations; for were not the hackney conveyances barometers by which the foot passenger might judge with, what shoes he should cover his feet withal? The touch of observation in the following lines is admirable:—

When on his box the nodding coachman
snores,
And dreams of fancy'd fares; when
tavern doors
The chairmen idly crowd; then ne'er
refuse
To trust thy busy steps in thinner shoes.

As illustrative of the influence of the weather upon chairs and chairmen, the *Annual Register* informs us that in December 1761 the fog was so thick in London "that even chairmen lost their way in the streets."

CHARACTER OF THE CHAIRMEN.

The allusion to the chairmen hanging about the doors of taverns recalls the fact that the reputation of these men for sobriety and steadiness was not very great, and many instances could probably be quoted of the dire disasters that ensued

from the drinking habits of the men. A hint of this is supplied by Gay, who tells how

The drunken chairman in the kennel
spurns,
The glasses shatter, and his charge
o'erturns.

But undoubtedly the best story on this subject is that in Dean Ramsay, who has the following amusing anecdote, which we give in his own words :—

"I may describe the sedan chair as a comfortable little carriage fixed on two poles, and carried by two men, one behind and one before. A dowager lady of quality had gone out to dinner in one of these 'leathern conveniences,'¹ and whilst upstairs her bearers were profusely entertained downstairs, and partook of the abundant refreshment offered to them. When my lady was to return, and had taken her place in the sedan, her bearers raised the chair, but she found no progress was made; she felt herself sway first to one side, then to the other, and soon came bump to the ground, when Donald behind was heard shouting to Donald before (for the bearers of sedans were always Highlanders), 'Let her down, Donald, man, for she's drunk.'"

It was not always the chairman who was tipsy in the days of those high-jinks which Sir Walter

Scott has so well portrayed: the conveyance home of a tipsy judge or a roystering lawyer was no uncommon job. The glass panes of the sedans often got broken on such occasions, the damage being of course paid in the sober time next forenoon. From this a species of black mail came to be exacted. "What is it to-day, Donald?" would be the question when the chair-bearer presented himself at the breakfast hour. "Anither pane, my lord," he would reply; and however strongly convinced that he had broken no glass the previous night, the *bon vivant* was fain to pay the exaction and save inquiry. We have this anecdote from the recollections of an old citizen of Edinburgh.

The mention of Highlanders reminds us that the sedan had an early home in Edinburgh, where throughout the century it is frequently referred to in contemporary literature. Hugo Arnot, in his *History of Edinburgh*, assumes great credit for the superiority of the chairmen of that city as compared with the Irishmen of London. He says :— "The chairmen are all Highlanders, and they carry the chairs so much better than the Irish chairmen of London, that an inhabitant of Edinburgh, who visits the metropolis, can hardly suppress his laughter at seeing the awkward hobble of a street chair in the city of London." That *all* the chairmen in London were not Irish may easily be guessed, notwithstanding Hugo

¹ This phrase was used by Lindley Murray's father to describe the "state coach" he got from Europe for his disabled son, and which was looked on as "an aristocratic innovation."

Arnot's insinuation ; and in proof of this we may, for example, refer to an entry in the *Annual Register* of 1763, where it is stated that at the election of Lord Warkworth as member for Westminster in March of that year, a party of sailors quarrelled with another of Irish chairmen, when the former getting the better, drove the others out of the field, and destroyed all the chairs they could meet with, except one, having on it these words, "This belongs to English chairmen." In the *Rake's Progress*, one of the chairmen wears a leek in his hat, showing him to be a Welshman.

"Lady Don was about the last person (so far as I recollect)," says Lord Cockburn in his *Memorials*, "in Edinburgh who kept a private sedan chair. Hers stood in the lobby, and was as handsome and comfortable as silk, velvet, and gilding could make it. And when she wished to use it, two well-known respectable chairman, enveloped in her livery cloaks were the envy of their brethren. She and Mrs. Rothead both sat in the Tron Church ; and well do I remember how I used to form one of the cluster that always took its station to see these beautiful relics emerge from the coach and chair."

SEDAN CHAIRS AT COURT AND THEATRE.

As a rule, the use of sedan chairs seems to have been confined to occasions of state and ceremony,

and they were used equally by night and by day, the accompaniments of torches being necessary in the badly-lit streets of our cities a century ago. We have the following allusion to this in Gay's poem on the streets of London, from which quotations have been already made :—

When in long rank a train of torches
flame
To light the midnight visits of the
dame.

And the spirits of the time found
congenial sport in the endeavour,
as Mat Prior says, to

Break watchmen's heads and chairmen's
glasses.

Of course sedans were largely used in going to court ; and in the *Rake's Progress* by Hogarth, the hero figures in Act the Fourth as going to court in this way when he is arrested by the catchpoles. "Tom, embroidered, laced, and powdered up to the eyes," says George Augustus Sala, in describing the picture, "goes to court in a sedan chair. It is a hired one, No. 41, and the hinder chairman, by the leek in his hat, would appear to be a Welshman. The rake's affairs have been going but badly lately. . . . He has been shaking his elbow, my dear. Hogarth insists very plainly on the gambling element in his career. In front of his sedan a group of blackguard boys are gambling on the flags of St. James Street. . . . The sheriff of Middlesex has been running up and down in his bailliwick seeking for Tom ; and now

two catchpoles march up to the sedan chair, and capture the body of Thomas Rakewell, him to have and to hold at the suit of our sovereign Lord the King and somebody else—very possibly the tailor who had made that fine suit of lace clothes for him." Very possibly the picture of this arrest is one that may have been frequently seen in the time of sedan chairs. The victim is so wholly at the mercy of his pursuers, without chance of escape!

For conveyance to public amusements, sedan chairs have been used in every large city. "To the obscure retreat of Old Playhouse Close," says Robert Chambers in his *Walks in Edinburgh*, "the liberal part of the gentry of Edinburgh . . . resorted to see such stars as Digges, Ward, and Bellamy; and many a night, as gossips tell, has this mean alley been crowded with sedans containing the most brilliant toasts who flourished in Edinburgh at the middle of last century."

CHAIRS AT BALLS AND ASSEMBLIES.

Next to their value to those in court-dresses, chairs were most grateful to ladies in ball-dress, whose wonderful costumes, and more wonderful head-dresses and coiffures, as they are shown in contemporary prints, were little suited for any other form of conveyance. There is no more suitable subject for the painter's art than the scene of the "Porteous Mob," as described

by Sir Walter Scott, and in the numerous illustrations of this scene the sedan chair figures conspicuously. In the National Gallery of Scotland is to be seen a beautiful delineation of this event, by Mr. James Drummond, R.S.A., a picture well known from engravings. In this painting the incident of the sedan chair is prominently shown, adhering closely to the following spirited description of the event given in the novel of the *Heart of Midlothian*.—"Many a quadrille party was spoiled that memorable evening, for the sedan chairs of ladies, even of the highest rank, were interrupted in their passage from one point to another in despite of the laced footmen and blazing flambeaux. This was uniformly done with a deference and attention to the feelings of the terrified females which could hardly have been expected from the videttes of a mob so desperate. Those who stopped the chair usually made the excuse that there was much disturbance in the street, and that it was absolutely necessary for the lady's safety that the chair should turn back. Persons are yet living (the story proceeds to tell) who remember to have heard from the mouths of ladies, thus interrupted, that they were escorted to their lodgings by the young men who stopped them, and even handed out of their chairs with a polite attention far beyond what was consistent with their dress, which was that of journeyman mechanics." This

refers to the case of a near relative of Sir Walter Scott, who was, as described in a note, thus stopped and escorted home, and whose attendant, a *baxter*, or baker's lad, handed her out of the chair, and took leave with a bow which argued breeding that could hardly be learned at the oven's mouth.

CHAIRS FOR VISITING.

Clarinda (Mrs. Macle hose), writing to Burns in 1787, and asking him to come to tea about eight o'clock one evening, says—"I hope you'll come *afoot*, even though you take a chair home. A chair is so uncommon a thing in our neighbourhood it is apt to raise speculation, but they are all asleep by ten." This fear of the neighbours will recall the same idea conceived by Cowper in his *Diverting History of John Gilpin* :—

The morning came, the chaise was brought,

But yet was not allowed
To drive up to the door, lest all
Should say that she was proud.

So three doors off the chaise was stayed,
When they did all get in ;
Six precious souls, and all agog
To dash through thick and thin.

NUMBERS IN USE.

The great number of chairs in use about the date of our last references may be gathered from Hugo Arnot, who says, in his *History of Edinburgh*—"If the number of hackney coaches be so wonderfully small (9), that of chairs again is considerable. There are at present 188 hackney chairs

in Edinburgh, besides about 50 private ones. The street chairs are to be had at a minute's warning at all hours of the day or night." In Maitland's *History of Edinburgh* (1738) it is mentioned that the number of chairs had increased of late, their number at that time amounting to ninety.

CHAIRS IN BATH.

We read also a good deal about chairs in Bath (not "Bath chairs" as we now know them), and the following reference, from the writings of Oliver Goldsmith, indicates another use to which chairs were put :—"The hours for bathing were commonly between six and nine in the morning. The lady was brought in a chair, dressed in her bathing clothes, to the bath, and being in the water the woman who attended presented her with a little floating dish like a basin, into which the lady put a handkerchief, a snuff-box, and a nosegay. She then traversed the bath, if a novice, with a guide ; if otherwise, by herself, and having amused herself thus, while she thinks proper, calls for her chair and returns to her lodgings."

An allusion to the same use of the sedan chair is furnished by Smollett, in *Humphrey Clinker*. In one of Matthew Bramble's letters we read—"I was impatient to see the boasted improvements in architecture for which the upper parts of the town have been so much celebrated, and t'other day I made a circuit of all the new buildings. The square, though

irregular, is on the whole pretty well laid out, spacious, open, and airy; and, in my opinion, by far the most wholesome and agreeable situation in Bath, especially the upper side of it; but the avenues to it are mean, dirty, dangerous, and indirect. Its communication with the baths is through the yard of an inn, where the poor trembling valetudinarian is carried in a chair, betwixt the heels of a double row of horses, wincing under the curry-combs of grooms and postilions, over and above the hazard of being obstructed or overturned by the carriages which are continually making their exit or their entrance. I suppose, after some chairmen shall have been maimed, and a few lives lost by those accidents, the corporation will think in earnest about providing a more safe and commodious passage. . . . If, instead of the areas and iron rails, which seem to be of very little use, there had been a corridor with arcades all round, as in Covent Garden, the appearance of the whole would have been more magnificent and striking; those arcades would have afforded an agreeable covered walk, and sheltered the poor chairmen and their carriages from the rain, which is here almost perpetual. At present the chairs stand soaking in the open street from morning to night, till they become so many boxes of wet leather, for the benefit of the gouty and rheumatic, who are transported in them from place to place. Indeed, this is a shocking inconvenience, that extends

over the whole city; and I am persuaded it produces infinite mischief to the delicate and infirm. Even the close chairs, contrived for the sick, by standing in the open air, have their frieze linings impregnated, like so many sponges, with the moisture of the atmosphere; and those cases of cold vapour must give a charming check to the perspiration of a patient, piping hot from the bath, with all his pores wide open."

CHAIRS FOR PATIENTS AND PRISONERS.

The last allusion suggests an idea in regard to chairs that is not very comfortable, and the propagation of infectious diseases may not improbably have been occasioned through the incautious admittance of fever patients into public chairs, much as the same result is sometimes charged against the cabs of our own day. Prisoners were sometimes taken to prison in such conveyances; for example, in the *Annual Register* for 27th August 1758 we read that a woman who used to pass for a woman of quality, and went by several different names, and kept servants in livery, who was committed to the Gate-house for embezzling the goods entrusted with her in her ready-furnished lodging, in Dean Street, Soho, was carried to gaol in a chair, attended by one of her footmen!

FARES AND REGULATIONS.

The fares and regulations for hackney chairs, during last century,

form an interesting subject of inquiry. We have already quoted a letter to George Selwyn, in which "three miles for a shilling" appears to be recognised as the fare, and the same sum is mentioned, as the unit of charge, by Gay, who says—

No coach to frequent visits rolls,
Nor for your shilling chairmen sling
their poles.

A very full and interesting table of the charges in Edinburgh is given in Maitland's *History*, showing the rates charged in the early part of the century. It will be seen the rate is very low in relation to the value of money in our own time :—

Table of Fares,

*Made by the Common Council of
Edinburgh, 1738.*

For every lift within the City or	s.	d.
Suburbs of Edinburgh	0	6
For a chair for a whole day	4	0
For a chair for half a day	2	6
For a chair for a week	20	0
For a chair to the distance of half- a-mile from Edinburgh, then to be free	1	0
To the distance of a mile from Edinburgh, then to be discharged	1	6
To the distance of half-a-mile from and to the City or Suburbs of Edinburgh	1	6
To the distance of a mile from and to the City or Suburbs	2	0

Among other regulations framed by the Common Council of Edinburgh, March 1st, 1738, occur the following for the better government of the chairmen within Edinburgh :—

4. That none of the above Chair-masters imply any of the

soldiers in the service of the city guard to carry any of their chairs, at any time, under the Penalty of 20 shillings *sterling*, to be paid by the master of the said Chairs.

5. That none of the Chair-bearers go within the Pales or on the Plainstones (at the sides of the streets), under the penalty of 20 Shillings Sterling, to be paid by the Masters of the said Chairs, and the Chair-bearers to be committed to Prison to the City Guard for 24 hours, for every such offence.

7. That all Chairs attending for a Fare shall stand on the "south" side of the street, from the lower End of the Guard (house) to *Blackfriars' Wynd*, and nowhere else on the High Street, under the Penalty of one shilling *sterling*.

In 1738 the owners of the hackney-chairs, and their servants, being of opinion that it would greatly conduce to their interest to be erected into a Society, petitioned the Common Council to that end. From Maitland's *History of Edinburgh* we learn that this was granted in 1740, and the Society had rules and regulations very like the Friendly Societies of the present day.

FORM OF CHAIR IN EIGHTEENTH CENTURY.

The illustration at the beginning of this chapter gives an excellent idea of the shape of the sedans of last century, and of the sturdy development of the limbs of the men by whom they were borne. The great letter-writer of last

century, Horace Walpole, has a curious reference to this enlargement of the *gastrocnemii*; when he writes to the Countess of Ossory, in June 1780, referring to the alarms caused by the Gordon Riots—

“My coachman has just been in Twickenham, and says half Bath is burnt; I trust this is but the natural progress of lies, that increase, like a chairman’s leg, by walking.”





CHAPTER III.

With chest begirt by leathern bands,
The chairman at his corner stands ;
The poles stuck up against the wall
Are ready at a moment's call.
For customers they're always willing,
And ready aye to earn a shilling.

Echoes of the Street.

MODERN CHAIRS—THE CHAIRMEN OF EDINBURGH—FARES AND REGULATIONS—EXISTING EXAMPLES OF CHAIRS.

MODERN CHAIRS.

THE nineteenth century had not gone far on its course till the march of improvement proved too much for the sedan chairs, and year by year their use fell off, till they finally disappeared. One of the latest records of their existence is to be found in the pictures of English life given by Fenimore Cooper, who published his *Sketches of English Society* in 1837. He says, "Sedan chairs appear to have finally disappeared from St. James' Street. Even in 1826 I saw a stand of them, that has since vanished. The chairs may still be used on particular occasions, but were Cecilia now in existence, she would find it difficult to beset down in Mrs. Benfield's entry from a machine so lumbering." The sedans of a more recent time were much less picturesque than those depicted in the illustrations already given, following in this respect the general decadence as

regards grace or beauty of form in articles of common use that characterised the end of last and the beginning of this century. As in Edinburgh the narrow streets and steep declivities rendered the sedan more than usually suitable for the conveyance of passengers, so we find that the use of the chair subsisted longer in that city than elsewhere.

When King George, on his visit to Edinburgh in 1822, commanded the performance of the opera of Rob Roy in the Theatre Royal, the sedan chairs of Edinburgh had one of their greatest and latest opportunities of display. Inhabitants of Edinburgh at that time have described to the writer the animation and gaiety of that scene, when all the rank and wealth and beauty of Scotland strove to be present, and when the wide streets around the theatre were rendered nearly impassable by the multitude

of sedan chairs in which the gaily dressed beaux and belles were conveyed to the scene.

Although nearly half-a-century has elapsed since the magistrates of Edinburgh ceased to publish fares and regulations for the use of hackney chairs, the writer of these pages has in recollection a few instances in which the ticket-porters or "caddies" of the city offered chairs for hire, and had the "poles stuck against the wall," exactly as described in the lines at the top of this chapter. A few elderly people preserved the habit of using a chair for going to theatre or assembly, and, in one instance at least, a private chair was to be seen upon the streets. The "last scene of all"—the last reminiscence of a custom once so prevalent—was in the use of a sedan chair to convey patients to the Royal Infirmary. This was only a few years ago given up in favour of a wheeled vehicle. For obvious reasons, the usual glass windows of this chair were boarded up to near the top, and, from a popular belief that only fever patients were borne in this darkened vehicle, the writer can recollect how people held their breath as the chair passed, or perhaps crossed the street, to avoid the risk of contact with the infected thing!

Mrs. Gaskell, the popular authoress of *Cranford*, in her pictures of genteel life in a decayed town, introduces the use of the sedan chair, as an evidence of almost archaic fashion, in the following incident, which seems to present

a fragment of one of Hogarth's pictures, yet portraying a scene such as many persons yet living may have witnessed:—"Not long after this, the maids and lanterns were announced. Mrs. Jamieson had the sedan chair, which had squeezed itself into Miss Barker's narrow lobby with some difficulty, and most literally 'stopped the way.' It required some skilful manœuvring on the part of the old chairmen (shoemakers by day, but when summoned to carry the sedan, dressed up in a strange old livery—long great-coats, with small capes, coeval with the sedan, and similar to the dress of the class in Hogarth's pictures), to edge, and back, and try at it again, and finally to succeed in carrying their burden out of Miss Barker's front door. Then we heard their quick pit-a-pit along the quiet little street, as we put on our calashes and pinned up our gowns."

THE FORM OF RECENT CHAIRS.

A coloured lithograph, of date early in the present century, in the possession of the writer, gives an interesting view of the form of the later hackney chairs, as well as the delineation of a singular incident in street history. The chair, which is numbered 21, is perfectly plain in its form, the walls being of black leather, and the roof of wood, with a double slope. The square of glass is in a wooden frame, and despite the leathern walls, the chair gives the

idea of great weight, while in its square ugliness, it almost reconciles one to the absence of chairs from the street. The incident is that of a small boy, a carpenter's apprentice, who, barefooted, has been carrying a flooring plank along the street, and has thrust it through the window of the chair. While one of the porters rests upon a stone, the other grasps by the hair the poor boy, who, with clasped hands, seems to ask for mercy, when the scene is completed by the advent of a well-dressed boy, who offers money to the irate chairman.

From *Kay's Portraits* we obtain, in the well-known sketch of "The Social Pinch," another illustration of the form of chair then in use. This drawing is reproduced as one of the characteristic incidents in an engraving of the "Parliament Close" of Edinburgh, in which all the prominent worthies depicted by Kay are gathered together, in what was at the beginning of this century the very nucleus and centre of life in the metropolis of Scotland.

THE CHAIRMEN OF EDINBURGH.

As in Hugo Arnot's day, so the chairmen of Edinburgh continued to the end to be chiefly recruited from the Highlands. They were a canny, shrewd, money-making race of men, trustworthy to a degree where they were trusted, and in many respects presenting a curious social study. We have in a former page referred to the establishment of a society of chair-

men in Edinburgh in 1740, and that the trade was a profitable one in the hands of the "canny" Highlanders who were its chief practitioners, is evidenced by a stone in Greyfriars churchyard, Edinburgh, bearing to be erected by "Donald M'Glashan, chair-master in Edinburgh, as a place of interment for his heirs in succession." M'Glashan, who then held the office of president of the fraternity, is said to have left very considerable property in houses, etc. In the drawing from Kay's *Edinburgh Portraits* already referred to, we have an excellent representation of the well-pronounced Celtic characteristics of the "chairmen." The sketch of "The Social Pinch" represents Donald Kennedy, a well-known chairman at the beginning of the century, seated on the pole of the sedan, and offering his mull—a small ram's horn—to Donald Black, a native of Ross-shire. In the letterpress accompanying the etching in the collected edition of the "Portraits," it is remarked that "the chairmen of Edinburgh, chiefly Highlanders, were at one time a numerous and well-employed body; some of them were known to amass large sums of money. The introduction of hackney coaches, however, together with a considerable change in the habits of fashionable life, has almost subverted the once courtly sedan." The few street porters of Edinburgh still preserve many of the characteristic traits of their predecessors the "chairmen."

FARES AND REGULATIONS.

For comparison with the table of fares a century before, given in the preceding chapter, we may give the published charges in Edinburgh at the beginning of this century, and also at the date when these were last authoritatively published. The rates given were those fixed by authority, but it need hardly be observed that there is plenty of evidence that the chairmen shared the well-known failing which characterises the cabman of our own day; having no objection to receive as much more than the legal fare as the hirer could be prevailed upon to pay him. "These animals," says the writer of *Hints on Commercial Travelling*, early in the century, "are duly labelled and numbered, and possess one characteristic in common, that of never being satisfied with the extent of your payment." Doubtless the unprotected female would not escape being victimised where a shrewd "bagman" found difficulty in escaping from the extortion of the chair-bearers.

The official regulations for chairs in Edinburgh in 1806 provide that—"Every chairman carrying or resting his chair under cloud of night, and not having a light fixed on the fore part of one of the poles, or carrying or resting a chair, at any time, on the foot pavement or plainstones, shall forfeit the sum of five shillings, and not less than two shillings and sixpence, for each transgression ;

be imprisoned, and the chair detained till the same be paid." Further rules provide that a number shall be distinctly painted on the front and back of each chair; that there shall not be the same number on two chairs, and that "the first or foremost of the bearers" shall bear a badge on his breast, with the number upon it. It is further provided that when any of the proper furniture of a chair, *i.e.* lining or cushion, shall be dirty or torn, or the glasses or blinds shall be broken or awanting, it shall be lawful to detain from the hire one shilling, or the whole hire, if it shall amount to more.

It is also ordered that on the occasion of any fire or mob within the city or suburbs, every chairmaster and chair-bearer shall immediately repair to the place where such fire or mob is, with their slings or braces, and obey such directions as the Magistrates may think proper to give. The charges are based on the rule of 9d. for about quarter of a mile, a shilling for half-a-mile, and so on, the highest fare being to Leith, 2s. 9d., or 3s. 6d. "under cloud of night," if after ten o'clock. For a day the hire is 7s. 6d., for a week £1 : 11 : 6; while for a double lift for two grown persons, double fare is allowed; "two children, or one child under ten years of age, in a person's arms, always excepted."

In Ramsay's *Edinburgh Almanac* for 1806, the fares are given somewhat differently. There the charge for a "hackney chair," from Parliament House to Queensberry

House in the Canongate (about half-a-mile) is 9d., and from the Castle to Holyrood (a mile or more), 1s. 9d.; while from Leith to Edinburgh the price is given as 2s. 6d. in day time, and 3s. "under cloud of night." From the theatre to any part of the New Town is stated at 6d., while to "Castle o' Clouts" or places in the three suburbs of the city, 2s.

In the Almanac for 1827, the fares are given more fully, showing the charge to be 7s. 6d. for the day, from 10 morning till 12 night; for the forenoon (9 to 4), 3s. 6d., and for the afternoon (4 to 12), 4s. 6d. From 12 midnight an extra 6d. was allowed to be charged, and double fare after two in the morning.

From 1830 downwards the rates for "hackney chairs" ceased to be given in the *Edinburgh Almanac*; but as we have seen, their use, to a limited extent, prevailed down to a later time.

EXISTING EXAMPLES OF CHAIRS.

In De la Croix's very beautiful book, recently published, and entitled the 18^{me} Siècle, the student of men and manners will find copious illustration of the use of sedan chairs in France; this mode of conveyance being in its heyday in that country, as well as here, during that period. The illustrations of life are mostly from royal and aristocratic circles, and the gorgeous chairs and the parade of retinue with which they were used are admirably portrayed in the

book. So far as our museums go, the endeavour has also been to secure specimens of the finer chairs, these being preserved rather as specimens of the art workmanship of the period, than as illustrations of the bygone manners of the people at large. In the *Musée Louvre* in Paris, for example, and in the *Hôtel de Cluny*, the visitor will encounter many royal chariots and royal sedans. In the latter are shown two sedan chairs which belonged to Louis Quinze—with glass windows in side and front, through which the sumptuous lining of crimson velvet is discernible. The outside is beautifully painted and gilt, and though now somewhat faded, the splendour of the vehicles can be imagined, even in their decay. The gorgeously attired king within, or it might be the queen or some reigning favourite, would be attended by a gay escort of gentlemen of the court, with a crowd of bearers and lacqueys, not to speak of armed guards, whose liveries probably equalled in grandeur the courtly habits of the greater men who surrounded the royal chair. The imagination has ample scope to disport itself in picturing such a scene, as the eye rests on the faded grandeur of the discarded state chairs, now only of interest as relics of the past. The Hôtel Cluny also contains, or did contain, an Italian chair, formerly belonging to a member of the famous Borgia family.

The South Kensington Museum also contains two sedan chairs. The first, of English make and dated

about 1760-80, is rather handsomely ornamented in ormolu, the sides being divided into four panels, but without windows. In form, the chair may be described as "carriage-bodied" not being, as in the later chairs, square at the bottom. At the two front corners heavy tassels are hung, and through the door in front it can be seen that the interior lining is of figured damask. The bearing rings through which the poles passed are of brass. On the whole this would appear to be the chair of some private person, without pretension to anything beyond comfort inside and elegance without. The other chair at South Kensington is of Italian manufacture early in the eighteenth century, and belonged to the Grand-Ducal Family of Tuscany, by whom it was used on baptismal occasions. Altogether this is much more ornate both in form and decoration than the other, and it is also larger—large enough, we may presume, to contain "mother and child" and perhaps also the nurse. It also is elegant in shape, and it is very elaborately ornamented in carving and gold. On the roof is a basket or vase with doves and cupids, and round the edge is a massive rail or trellis work, richly gilt. Over the centre of the front door is medallion-painting of figures in antique costumes. The front and sides of the chair are painted of a pale French grey, with elaborately carved mouldings round the panels, with groups of

flowers painted in the middle. The interior is lined with satin corresponding to the painting outside, being in gold and colours upon a pale ground. In the London Annual Exhibition of 1873 were shown several sedan chairs belonging to the Duchesses of Northumberland, also some litters from India and Japan.

Though less interesting in an artistic point of view, the sedan chair in the Museum of Antiquities at Edinburgh may rank with the others either in historic interest or from a social point of view. This chair, a plain black "leather convenience" with a simple ormolu beading, was presented to the Museum by the late Sir James Simpson, who was well known as a distinguished antiquarian. This vehicle, with its simple trappings and commonplace interior, is of interest as having been the last private chair used in Edinburgh. Its owner was Dr. Hamilton, who died about forty years ago, and who, disdaining the more modern contrivance of a "pill box" (as the brougham or clarence so long affected by the medical fraternity was somewhat irreverently called), continued to visit his patients in his private chair, borne by two sturdy porters. From continuing to wear the cocked hat of an earlier period, which he preserved along with the knee-breeches and shoe-buckles, this physician rejoiced in the popular *soubriquet* of "Cockie Hamilton."



CHAPTER IV.

Let observation with extensive view
Survey mankind from China to Peru.—JOHNSON.

SEDAN CHAIRS IN CHINA—CHAIRS IN JAPAN—THE FORM OF THE
JIN-RIKI-SHA—HOW THE JIN-RIKI-SHA STRIKES THE STRANGER—
WHEELED SEDANS IN EUROPE.

SEDAN CHAIRS IN CHINA.

WE have seen the British traveller struck in various parts of the world with the same feeling that made the populace in Charles's time deride the overmastering pride of Buckingham, who made men beasts of burden. Whether in the form of the Roman litter—where the number of bearers and attendants was the index to the traveller's wealth and station—or in the palanquin with which travellers in India, Madagascar, and other eastern nations are familiar ; whether in the sedan chairs of China, where numbers of the bearers are carefully graduated, or in the "norimon" of Japan,—in brief, in every country where the demands of wealth and social station have outstripped the mechanical arts, we find a portion of the helots of that country acting as "beasts of burden" for their richer brethren. Where wheeled carriages are unknown, or where the roads are not yet made after the pattern of Telford or Macadam, or where mere lord-

liness of disposition delights to exact degrading service from low-born dependants, there some form of the sedan chair will be found. In China, with which we are more immediately concerned, it would appear that a retrograde step has been made, so that the small two-wheeled carriages described by Barrow have been nearly given up in favour of the sedan chair. Those carriages are described by Barrow, in his *Travels in China*, as "small covered carriages on two wheels, not unlike in appearance to our funeral hearses, but only about half the length ;" and he proceeds to tell that those who made choice of the little covered carriages found themselves extremely uncomfortable, notwithstanding they were the best, the most easy and genteel sort of carriage that the country afforded. Being fixed on the wheels without springs, and having no seats in the inside, "they are to the European, who must sit on his haunches on the



STATE PALANQUIN.

bottom, the most uneasy vehicles that can be imagined."

On the authority of Father Sernedo, one of the earliest missionaries to China, it is stated that coaches of this sort were anciently in common use in that country, and that they were laid down on account of the great convenience and little cost of sedan chairs. The coaches alluded to by the reverend father were in all probability the little carts mentioned by Barrow, as that traveller asserts that not the vestige of anything better in the shape of a carriage was to be found in China, or the least appearance of anything like a spring carriage.

Chairs were thus in all probability in common use in China from an early period of its history, and they continue down to this day. "The Chinese," says Davis, "occasionally travel on horseback, but their best land conveyance by far is the sedan, a vehicle which certainly exists among them in perfection. Whether viewed with regard to lightness, comfort, or any other quality associated with such a mode of carriage, there is nothing so convenient elsewhere. Two bearers place upon their shoulders the poles, which are thin and elastic and in shape something like the shafts of a gig, connected near the ends, and in this manner they proceed forward with a measured step in an almost imperceptible motion, and sometimes with considerable speed. Instead of panels, the sides and back of the chair consist of woollen

cloth for the sake of lightness, with a covering of oil-cloth against rain. The front is closed with a hanging blind of the same materials in lieu of a door, with a circular aperture of gauze to see through. . . . Private persons among the Chinese are restricted to two bearers, ordinary magistrates to four, and the viceroys to eight, while the Emperor alone is great enough to require sixteen."

FORM OF THE CHAIR IN CHINA.

The form of the chair used in China is very much the same in regard to ugliness as the later hackney chairs in this country, but the style of decoration is bright and characteristic. In Oliphant's *Narrative of the Earl of Elgin's Mission to China and Japan*, is given a description of the procession of Lord Elgin and his suite to exchange the terms of the Treaty of Tien-sin. "The procession was composed of the ambassador and suite, in twelve chairs, accompanied by a guard of honour of 150 marines preceded by the band of the 'Calcutta.' Lord Elgin's chair was of the description usually employed by mandarins of the highest rank, much larger than the ordinary size, surmounted by a brass knob and borne by eight bearers." An illustration of the chair in which Mr. Oliphant was borne is given in the first volume of the *Narrative*, with four bearers, and the covered top also surmounted by a brass knob.

The "mountain chair," much



A CHINESE MARRIAGE PROCESSION.

used in China, is of a much simpler construction than that used in towns or for ordinary travelling. Many references to this light form of chair are found in Mr. Fortune's various books on China. He says (*Wanderings in China*, p. 167), "The mountain travelling chair of China is a very simple contrivance. It consists merely of two long bamboo poles, with a board placed between them for a seat, and two other cross pieces, one for the back and the other for the feet; a large umbrella is held over the head to afford protection from the sun and rain." In his *Residence among the Chinese*, Mr. Fortune says, "Sometimes, when ladies or children are to be carried, and the weight consequently light, I observed two or three of these seats slung between the poles, and this number of persons carried by two stout coolies with the greatest ease."

In the "Chinese Collection," an exceedingly popular exhibition in London about quarter of a century ago, the writer has the recollection of having seen some representations of gorgeous chairs used on state or ceremonial occasions. One of these showed the Tsung-tu, or Viceroy of Canton, in a sedan, with eight bearers and retinue. The number of bearers to each sedan in China being restricted by the rank of the person, only mandarins or official persons can be carried by four bearers, or accompanied by a train of attendants. The latter are marshalled in two files before the chair; one pair carrying

gongs, on which they strike at intervals; another pair emit a long-drawn shout or yell, to indicate the approach of the great man; while a third pair, the jailors or executioners, with high caps of wire, jingle chains as they go. Then come two men with the bastinado; others carrying big umbrellas, etc. In another part of the exhibition was a bridal procession, in which the bride is carried in a richly carved and gilded sedan, appropriated to such occasions, and called the "Hwa-keau," or flowered chair. In China, large establishments exist where men, chairs, attendants, etc., can be hired for such occasions, the chairs ranging through all degrees of costliness and elegance. In a bridal procession there will sometimes be a dozen sedan chairs filled with the presents to the bride. The sedan chair nearly fills the ordinary width of a street, and it is borne on the shoulders of the coolies, not in the hands with shoulder-straps, as was the case in Britain. The interior of the chair is commonly large enough for a single occupant only, and the sides are, in many cases, made of silk, this being lighter than wooden panels, an oil cloth cover being provided in case of rain. The bearers place the light bamboo poles on their shoulders, and move forward with considerable speed, and with a measured, elastic, steady motion. The "Keau," or sedan, was for long a subject of contention between the foreign residents and the Chinese, the use



THE "JIN-RIKI-SHA," OR JAPANESE "MAN-POWER CARRIAGE."

of chairs having been denied to the former ; but, as we have seen, they are now allowed.

CHAIRS IN JAPAN.

While the Chinese may be quoted as the type of impenetrable conservatism, when we turn to the neighbouring nation a different feeling is found to exist. Up till a few years ago, Japan was perhaps more exclusive and obstructive than China, but now that the national mind—at least the official mind which directs the people of the Mikado how they should act and think—has been opened, there has been developed a great thirst for progress, and a strong desire to adopt all the mechanical improvements and facilities enjoyed by the Western nations.

So far as the subject of this chapter is concerned, it may be enough to allege that Japan, in common with China, has for a long period made use of sedan chairs, in one or other of their forms, not only as vehicles of state, but as conveyances for pleasure and convenience. It is to be remarked that in Mr. Laurence Oliphant's account of Lord Elgin's mission, already quoted in reference to the use of sedan chairs in China, there is no mention of any other mode of conveyance in Japan. Up till that period there were in abundance in the streets and roads of Japan the light bamboo chairs called "kangoes," which were borne by two persons, just as our Irish or Highland porters carried sedans

in London and Edinburgh. There were also "norimons," or palanquins, the sedan chair proper, which, like the chairs in China, was carried by four, six, or eight bearers, according to the rank of the person using it.

INTRODUCTION OF CHAIRS UPON WHEELS.

In Yokohama there is published an English journal of somewhat unique character, entitled *The Far East*, the peculiarity being that the illustrations of events, incidents, places, and national customs or costumes, are given not in wood engravings, but in photographs. In a number of that journal published in 1872, a description and illustration are given of the new wheeled sedan which at that time was rapidly putting the carried chairs out of use, wherever the improvement of the streets of the towns or the extension of public roads round the capital and other towns is carried out. The writer says—

"As late as 1868 there were in Japan few wheeled vehicles of any kind, kangoes (light bamboo chairs) or norimons (a kind of stunted palanquin)—the former carried by two bearers, the latter by two, four, six, or even eight, according to the rank of the occupant and the nature of the road—were the only modes of conveyance. After the introduction of coaches and two-wheeled traps by 'foreigners,' some ingenious Japanese took it into his head to

make a kind of enlarged perambulator, drawn by one man, and it is surprising to learn how readily the invention took. Within a year or two a 'kango' became a curiosity, and 'norimons' were few and far between; while by 1872 it is estimated there were 40,000 jin-riki-shas in Yeddo and its suburbs."

A more recent correspondent says—"There are no cabs in Yeddo drawn by horses. They have "jin-ri-kishas," something like a two-wheeled invalid chair with trams, drawn by a man. I am told these men can *run* with you to Yokohama, a distance of 20 miles, without thinking anything of it. These 'ri-kishas are in thousands all along the streets in Yeddo."

THE FORM OF THE JIN-RIKI-SHA.

Our illustration gives a good representation of the form of this novel chair, and of the mode of propelling it. It shows, however, one of the plainest form, and the shapes the new wheeled sedans are made to assume are often singular and fantastic. "Most of them," says *The Far East*, "have some fancy design on the sides or back, while some are of shapes both curious and ingenious. Some are to be seen shaped exactly like a Japanese junk, in white cedar, and unpainted, after the manner of real junks. Others embody that quaintness and love of the grotesque which distinguish the Japanese mind." In the journal

from which some of the above particulars are taken, is given the representation of a "jin-riki-sha;" the body of which is shaped like a bird, the fore part rising up like the neck and head, while the body, within which the passenger (a lady) sits, is carved and painted into the representation of feathers.

Mr. J. F. Campbell, the most recent writer on the subject, and whose work, *My Circular Notes*, we have permission to quote, speaks of the decoration of these man-power carriages in the following terms:—"The carriages were as usual very well made, very light and easy. I doubt if a London builder could have made much better work. The body was laquered, and the black varnish covered with pictures of crows in gold; they were very well drawn. Japs never design anything like the rest of the world. In other countries designers are apt to compose evenly, with something in the middle, and two somethings at each side to balance. Here five or six crows were scattered all over the carriages so as to avoid uniformity; a crow was on the corner, half on the back, half on the side. . . . The Japanese artist cannot abide uniformity, but somehow his design is always pleasing."

SPEED OF THE JIN-RIKI-SHA.

The mode of pulling the wheeled chair along is not less remarkable than the speed and endurance of the men who have

constituted themselves the human ponies of the people. Relieved of the shoulder weight which forbade a chair borne by eight or more coolies advancing at more than a shamle or trot, the drawers of the new vehicle which has so rapidly commended itself to the Japanese mind attains a speed which seems to shame that of the "running footmen" who accompanied the carriages of the wealthy in this country at an earlier period. With a good road, a speed of not less than eight miles an hour is attained, and this, as our latest information shows, can be kept up for a considerable time.

"The road was very good," says a writer in the illustrated journal already quoted, "and M. arrived before the ponies, his chariot having a splendid coolie who ran the two ri (five miles) in thirty-five minutes. As soon as you are seated, the man, who generally divests himself of all clothing, showing a body beautifully tattooed, gets between the shafts, lifts them off the ground and raising the cross-bar even with his breast, pushes the carriage along with his hands, going over the flat roads at a great pace."

The structure of this wheeled chair is favourable to a high speed, for while the spring of the poles in the hand-borne chair make it very uncomfortable if accelerated beyond a low speed, the "jin-riki-sha" is a comfortable vehicle at the speed mentioned.

The following incident gives a lively picture of "jin-riki-sha"

travelling:—"Having despatched one of my servants a day previously to Oddawara, a town about forty miles from Yokohama to be in waiting my arrival there with a good dinner, I ordered a 'jinricksha,' i.e. a large-sized perambulator drawn by a coolie in the shafts. The coolie, a man standing full six feet, was to be my pony *pro tem.*, and had to run with me to Oddawara, a distance, as I have stated, of forty miles. Having placed my portmanteau and sundry other articles, we started from Yokohama at 8 A.M. The coolie's only clothing consisted of a piece of calico tied round his loins and a handkerchief round his head. Onward we sped at the rate of six miles an hour, and soon we were passing through the foreign settlement, and after passing through several streets we came upon the ground where the railway station is built. Farther on we came upon the hill north of Yokohama known by the name of the Noge Yama. As the ascent is somewhat steep, it is the general custom to come out of the 'jinricksha' and walk, whilst the coolie gets some one to give him a helping hand with his vehicle to the top. . . . We get fairly into the country, and the coolie is once more gaining wind and strength as he journeys on over a smooth road. After a run of about two miles, we come upon the Tokiado, or the great eastern road of Japan. Japan is as yet very deficient in roads. After traversing the Tokiado for about six miles,

we reach the village of Totska, a favourite ride or drive with foreigners. Arrived there you come out of your 'jinricksha,' and your coolie at once prepares himself for his bath, which by this time he is sorely needing. The bath is usually hot water—heated to the point which to our fancy we would consider scalding. However, after his long run he seems to enjoy it, and after he is finished he resembles in appearance a Red Indian. His bath over, his next movement is to procure about a dozen raw eggs, which he devours most greedily, together with two or three bowls of rice along with tea. Having refreshed both coolie and myself, we are once again journeying to our next halting-place. Owing to the smoothness of this part of the road, the rapidity with which the coolie can travel is something surprising, and would astonish the best of our professional athletes. I question much if many of said athletes could keep up with these men, for it must not be forgot what the coolie has to haul along with him—a weight, including an adult and his 'jinricksha,' of upwards of two cwt."

Another illustration of the speed of this curious vehicle may be quoted from the writer of *Notes from a Six Years' Resident in Japan*, who furnishes the preceding description:—

"Bidding the inmates of the hotel 'ayanora,' or good-bye, I jumped into the vehicle, and was once again continuing my journey.

The coolie, knowing that he had at least a good fifteen miles' run before we came to our next halting-place, made good use of his strength for the first half-hour, so that by that time we had left Fujisano a good four miles behind."

Another traveller, writing in *The Far East* some years earlier, says—

"From Fushimi to Kioto cannot be more than six or seven miles. This final stage of my pilgrimage I performed in a jin-riki-sha drawn by two men in an hour and a half—the roads being heavy with recent rain. Coolies carry your baggage, the charge for jin-riki-sha with two men and two baggage coolies being from 6 to 8 boos (6 to 8 shillings in English money)."

Mr. J. F. Campbell, on the questions of speed and cost says—"With three jin-riki-shas and two men to each, drove seventeen miles and a half, at the rate of four and a half per hour, including stoppages to eat and two ferries, at a cost of a little more than a penny a mile per man;" and he adds. "The quaintest part of the proceeding was to sit and feed, and converse with my team of human ponies."

HOW THE JIN-RIKI-SHA STRIKES THE STRANGER.

"Jin-riki-sha, man-power carriages, being utterly new, astonished me. Some eight or nine years ago, great men, and small men who could afford it, were

solemnly carried about in various kinds of sedan chairs or palanquins, or in Japanese 'norimons' or 'cagos.' People also rode upon horses, but so far as appears from records and pictures and sculptures, nobody had ever seen a wheeled carriage in Japan. Some ingenious Englishman got a pair of wheels and an arm-chair, and hired a coolie to haul him about after the manner of a porter in a 'Bath' chair. But this Yokohama perambulator was the seed of a great invention, which, having fallen in the right place at the right time, sprang into being, and grew with the rapidity of a bamboo, till the whole country of Japan was overrun with jin-rikishas.

"There had been a great political revolution. Feudal barons with armies and with men in armour, and morions, and tabards, and all that pomp which belongs to our Lord Mayor's Show and the Middle Ages, had suddenly given way with a crash. There was nobody left to carry about in state. But there were vast numbers of people who were labourers out of work. Further, there were a great many farmers, who had not dared even to ride their own horses, who suddenly found legions of sworded men, who had lorded it over them, longing for work, in order to earn rice enough to keep life in their healthy hungry bodies.

"When the French broke out in 1848, one of the first things the mob did was to ride in king's

coaches. They had out all the state-coaches and horses, and all the king's men, and took a drive. *Gulliver's Travels* turned out to be prophetic. The driven drive the drivers in Japan; the old arm-chair gave birth to a whole swarm of neat carriages adorned by the clever hands of the artists who lacquered and gilded the state chairs of Daimios. Ruined gentle-folks and soldiers and coolies put themselves into the shafts, the farmers got inside, and for forty miles up and down the Tokiado, (east coast road) I saw, for the first time, Yahoos where I had been used to see horses—I saw men in armour disarmed and harnessed, and got 'a wrinkle in my horn.' The people who can change so rapidly will be apt to go ahead. The picture which I have before me is not a single man hauling about an old woman with a bundle of greens going to market. I see again what I saw on forty miles of very good road, with houses in sight on both sides all the way, as thickly peopled as a London suburb, with all the people working in the open air in any dress that happened to suit them, or in no dress at all. All along that busy road, full of living pictures, I see country folk in man-power carriages trotting about their avocations as if they had all been raised for that special purpose, and taught that special employment from childhood. Yet all this began to grow in Japan some eight or nine years ago. It is the

apotheosis of an old arm-chair, which was a Tycoon's throne and is a post-chaise.

"A coolie.—I see a lady in full dress—gown, veil, gloves, bracelets, and parasol—gravely seated in a perambulator at Yokohama, going out to visit another lady as calmly as if her Yahoo were a horse. She does not see the grotesque incongruity which makes me stare. The man is clad according to police regulations, but the old man of Japan is strong within him, and his garments flutter loose. He is a coolie, adorned with pictures; an illustrious illustrated edition of a civilised man, whose civilisation is barely covered by European forms. Such a man takes me out for a drive, and strips to his work, and becomes a Japanese Greek athlete by folding up his garments and stuffing them under my seat. His hide is a gallery of Japanese art; serpents coil about his legs, a tortoise is on one arm, an eagle flies on the other, or a Japanese lady smiles on me from between his shoulders, in some theatrical pose. There is no indecency in nudity; there is none in the style of art; but this particular Japanese phase of Eastern civilisation is new to a traveller who comes westward from England over America, through another phase of European life. The East and the West in a jin-riki-sha are utterly astounding and grotesque to an amateur artist. I throw away the pencil; I can remember astonishment, and look at such marvels when I shut my

eyes; but I cannot make anybody in England see what everybody in Yokohama sees every hour of the day with the utmost placidity. I can run away to the Vatican, or Pompeii, or up to the middle of Finland, and realise the magnificence of the human form and the ugliness of all manner of clothes; but clothes and no-clothes in one carriage tend to laughter." (The above racy description of the origin of the jin-riki-sha, and its effect upon a European traveller encountering it for the first time, is taken, by permission of the publishers, from *My Circular Notes*, by Mr. J. F. Campbell (1876).

WHEELED SEDANS IN EUROPE.

The jin-riki-sha of the Japanese is in all probability an individual conception, but the claim to originality can hardly be admitted, when the *vinaigrettes* of Paris, in the early part of the seventeenth century, are remembered. The sedan upon wheels, invented by a person of the name of Dupin, was vigorously opposed by the men who kept sedan chairs for hire in Paris. The name given to it by the inventor was *Brouette*, or *Roulette*; but the derisive epithet of *vinaigrette* was applied, though it will be difficult to see in what respect the wheeled box was more like a *vinaigrette* than one borne upon poles between men's shoulders. Dupin, the inventor, found means to contrive them so that they did not jolt so much as might be expected, and he was



BROUETTE, OR WHEELED SEDAN.

able to conceal this art so well that for a long time he was the only person who could make them. The first attempt to introduce them was made in the time of Louis XIII., but the proprietors of the sedans prevented them for a time. In 1669 they were first permitted, and they came into common use

two years subsequently. Their use was, it is believed, confined to the common people of the city, the gentry using their own sedans or carriages. These brouettes obtained some footing in Britain, but references to them are few. The form of the vehicle is shown in our illustration.





THE COACH.

CHAPTER I.

"Yet there has been knights, and lords and gentleman, with their coaches ; I warrant you coach after coach."—*Merry Wives of Windsor*, ii. 2.

EARLIEST NOTICES OF COACHES—ETYMOLOGY OF THE NAME—EARLY USE OF COACHES IN EUROPE—OPPOSITION TO THE USE OF COACHES—INTRODUCTION OF COACHES INTO BRITAIN.

EARLIEST NOTICES OF COACHES.

LIKE the sedan chair, the coach had reached a considerable development as a means of conveyance at the beginning of the century of years which these chapters are designed to illustrate. But it had a much earlier origin, and it went on, reaching more and more perfection in form and construction, as well as extending in use, till the invention of railways threw it into the back-ground, and reduced what was almost universal in its use to a subsidiary position in the art of travelling. Although the period when carriages were first seen in this country is generally fixed at some point in the sixteenth century, there is no doubt that, in some form or another, wheeled vehicles were known in Britain at a much earlier time. As we proceed it will be seen to what an extent the in-

troduction of wheeled vehicles depended upon good roads ; our illustration of a traveller on horseback, in the quaint costume of last century, being suggestive of times when even to men mounted on good horses the state of the roads was the chief obstacle in the way of comfortable travelling. One hundred and fifty years after coaches, in the modern acceptance of that term, were known in Britain, the roads were far from offering as great facilities to the traveller as the most ordinary farm road or hill track often does now. It is not to be supposed, however, that the difficulty of bad roads was insuperable. Our ancestors, even in very early times, had a heavy, determined, and stolid way of meeting difficulties ; and even in the days of the ancient Britons it is ascertained

that wheeled vehicles of some rude form or another were known.

Strutt, in one of his learned

works says—"The war chariots of the Britons were of three sorts, all different ; as the Covinus, the



Rheda, and the Essedum. The first of these was armed with hooks and scythes. This is thought to have been a light kind of

chariot, made upon such a construction as 'only to contain the charioteer ; for their principal use depended upon their force and

rapidity, as all the execution was done with the sharp hooks and scythes which were made fast about it. The others, the Rheda and the Essedum, are supposed to have been larger than the Covinus, and without hooks : these, besides the charioteer, contained some few warriors, armed with lances, which they threw at the enemy with great skill as the chariots passed rapidly by. We may easily conceive that the number of war chariots in Britain must have been immense, when we consider that Cassibellanus, after he had disbanded the greater part of his army, retained still four thousand of them ; and at the same time, we may observe that the use of them was universal amongst all the nations of Britons." On this subject, a writer in the *Quarterly Review* thirty years ago remarks that, "it might be inferred that the aboriginal Britons must have had roads, and good roads too, as they had *chariots* ; but when we also read that those chariots were driven to and fro at full speed on any accidental field of battle, where of course art could not have removed the natural inequalities of the ground, we know not what to think of it, and are disposed to doubt whether such chariots as could career over the wilds and the woodlands of Caledonia or Anderida, needed good grounds."

From Strutt we also learn of two kinds of wheeled carriages used amongst the Anglo-Saxons ; the first only designed to carry one person, and not unlike the

light farm carts of last century running on two wheels, and drawn by two horses abreast ; the other larger and also drawn by two horses. The form of the latter is not unlike a hammock slung between two upright posts. Strutt also mentions another kind of carriage, as shown in old manuscripts, which he describes "as a large long flat board made fast on an axle-tree supported by two wheels." In another part of this section we will have occasion to refer to a rude Irish car, in use within our own period, which very nearly answers Strutt's description and figure of this Anglo-Saxon "coach" from the Cottonian MSS.

ETYMOLOGY OF THE NAME.

Passing from a time so far distant from the period treated of in this work, it may be of interest, before introducing some of the earliest notices of vehicles in mediæval times, to make some inquiry as to the derivation of the words coach and chariot. The attempts to fix these are certainly more ingenious than satisfactory ; and without attempting any dogmatic assertion on the point, it may be sufficient to show what some of those speculations are, leaving the reader to choose for himself, or to make further research into this interesting question of etymology. It will be found that most of the derivations given have some resemblance to Sir William Thomson's speculation as to the origin of life, in his address

at one of the Edinburgh Meetings of the British Association—they only throw back the question a stage further. The following forms of the word, drawn from various sources, may help to elucidate the origin of the term :

English	<i>Coach.</i>
Spanish	<i>Cocchio.</i>
Dutch	<i>Koetse.</i>
German	<i>Kutsche.</i>
French	<i>Coche.</i>
Hungarian	<i>Cotczy.</i>
"	<i>Kocsi.</i>
Flemish	<i>Goetse.</i>
Greek	<i>κόγχη.</i>
Sanscrit	<i>Cankha.</i>
Old French	<i>Coque.</i>
Spanish	<i>Coca.</i>
Italian	<i>Cocca.</i>
Armoric	<i>Koked.</i>
Old German	<i>Cocho.</i>
Dutch	<i>Kaag Kog.</i>
Welsh	<i>Cwch.</i>
Irish	<i>Coca.</i>

The Greek and Sanscrit words stand for a shell, pointing to the form of the coach, and the eight last given designate a small boat or vessel. The word coach is nearly allied to the verb to lie, and thence to the couch or bed on which men lie. The French form of the word is very nearly the same as *coucher*, to lie, and there is an obvious connection between the earlier description of coach and sedan chair and this form of the word. In the early sedans, and in the palanquins of our own day, the idea of lying is familiar, and it seems not at all improbable that the earliest coaches

were, in point of fact, vehicles in which the traveller did not sit, but reclined. In Beckmann's *History of Inventions*, we encounter the following suggestions :—

"The person who drives such carriages is by the English called *coachman*, which in other languages is made shorter, as the French say *cocher*, and we (the Germans) kusk. It is difficult, however, to determine whence it is derived, as we do not know by whom these close carriages were invented. Menage makes it Latin, and by a far-fetched derivation from *vehiculum*. Junius derives it somewhat shorter from *ὑχέω*, to carry. Wachter thinks it comes from the German word *kutten*, to cover; and Lye from the Belgic *koetsen*, 'to lie along,' as it properly signifies a couch or chair."

That Hungary is the true home of the coach—at least of its name—is thought by many. Stephanus Broderithus says, speaking of the year 1526, "When the archbishop received intelligence that the Turks had entered Hungary, not contented with informing the king of this event, he speedily got into one of those light carriages which from the name of the place we call *kotcze*, and hastened to his majesty." The words "from the name of the place" make it appear as if the thing "coach" had been known before, while the name "coach" was new; just as white scarves were worn by gentlemen before the battle of Steinkirk though since taking their name from that event. Beckmann quotes another circum-

stance pointing to Hungary as the parent country of the name :—

* Siegmund, Baron de Herberstein, ambassador from Louis II. to the king of Hungary, says, in his *Commentarie de rebus Moscoviticis*, where he occasionally mentions some stages in Hungary, 'The fourth stage for stopping to give the horses breath is six miles below Jaurinum in the village of *Cotzi*, from which both drivers and carriages take their name and are still generally called *cotzi*.' These references seem to show the word to be of Hungarian extraction, and that it had its rise from a village in the province of Wieselburg which is called *Kitsee*, which was formerly known by the name of *Kotsee*, and that this travelling machine was first invented there. Early in the sixteenth century, or perhaps even sooner, a kind of covered vehicle was known under the name of the Hungarian village. But on the other hand, Mr. Monkland quotes evidence against this view. He says, in his paper in *Archæologia*, vol. xx., that 'the word chariot, in our present translation of the Bible, is termed *chare* in Wicliff's version. 'He turned again sitting in his chare, and redynge Isaie the prophett. And the Spirit seide to Philip, Neighe then, and joyne thee to this chare.' In Harmer's translation of Beza's sermons, a passage stands, 'King Solomon made himself a *coche* of the wood of Lebanon.' This word has at different times been rendered *palace*, *bed*, and in the authorised version, 'chariot.' In Wicliff it

is a *chaier*. In the Vulgate, *ferculum*. The Hebrew makes it a bridal couch or room. This tends to prove that the true derivation of the word is from *coucher*, and that it implied originally a moveable couch or bed. We need not, therefore, resort with Minshew for the etymology of the word to Kutzsche (*a verbo Hungarico Kotezy*), or to Cushey the Cambridge carrier."

From another source we read that the term chare appears to be the Anglo-Saxon *chær* or chariot, and that the various articles took the names of chares, cars, chariots, caroches, and whirlicotes. The *carreta* used by the queen of Charles of Anjou in entering Naples in 1280 suggests an obvious source for the name of the modern chariot. None of the words could, however, be marked off by a sharp line one from the other; as from Spenser we have, in the following lines, evidence that the chariot, waggon, and coach of his day were interchangeable terms :—

Tho', up him taking in their tender
hands
They easily unto her charett beare;
Her teme at her commandement quiet
stands,
Whiles they the corse into her wagon
reare,
And strowe with flowers the lamentable
beare;
Then all the rest into their coches
clim.

EARLY USE OF COACHES IN EUROPE.

One of the earliest records of a

coach, in comparatively modern times, is that of the *caretta* above referred to. That it was an open car, shaded simply by a canopy—like the “pleasure-vans” of the Cockney of our own day, or the waggons of the *Ebénistes*, which plied so vigorously for hire in Paris during *l'Exposition* of 1867—may be gathered from the records. The coach used by the queen is described as covered

outside and inside with sky-blue velvet, interspersed with golden lilies, which, as Beckmann records, was “a magnificence never before seen by the Neapolitans.” The word chariot or char is very common as descriptive of coaches in early times. Thus in the treatise on miracles of Saint Liudgar, quoted by Ducange, mention is made of a lady and her daughter going to church in a chariot; and



in an ordinance of Philip the Fair of France, issued in 1294 for suppressing luxury, the citizens' wives are forbidden to use carriages (*chars*).

Stow, speaking of Wat Tyler's rebellion in 1380, says, “Coaches were not known in this island; but chariots or whirlicotes then so called, and they only used of princes or men of great estates, such as had their footmen about them.” After remarking that in

the following year Richard married Anne of Bohemia, he says, “and so was riding in these whirlicotes and chariots forsaken, except at coronations and such like spectacles.” The same limitation of coaches to special uses is confirmed by M. Ramée, in the volume *La Locomotion*, to which we shall have frequently occasion to refer, and where it is said that “the authors of the different periods of the middle ages only rarely cite the

use of a carriage. The carriage was only in use at that epoch for invalids or infirm rich people (*les infirmes riches*)."

In the *Nibelungen Lied* there is frequent mention of carriages of two and four wheels. The last are named complete carriages, entire carriages, in opposition to the coaches with two wheels, but no very definite conception as to their general use can be obtained.

As regards France, we read in Beckmann's *History of Inventions* that private persons, such as physicians for example, used no carriages in the fifteenth century, this conclusion being, it is thought, proved by the principal entrance to the French Public School, (which was built in 1472), being so narrow that a carriage could not pass through it, though it was one of the widest of that period.

It is recorded by Wordsworth in his *Ecclesiastical Biography* that in 1527, when Wolsey visited France to negotiate a peace, the Dame Regent, mother to the king, entered Amiens, "riding in a very rich chariot, and with her therein was the queen of Navarre, her daughter, furnished with a hundred and more of ladies and gentlewomen following, every one riding on white palfries; besides diverse and many ladies, some in riche horse-litters and some in chariots." In the year 1544, when Count Wolf of Barby was summoned by John Frederick, elector of Saxony, to go to Spire to attend the convention of the States assembled there, he requested leave, on

account of his ill state of health, to make use of a close carriage with four horses.

Coaches were seen for the first time in Spain in the year 1546. Such is the account of Twiss, who, according to his usual custom (as Beckmann remarks), says so without giving his authority. Covered carriages were known in the beginning of the sixteenth century, but they were used only by women of the first rank, as men thought it disgraceful to ride in them.

The use of covered carriages was, for a long time, forbidden even to women. In the year 1546 the wife of a certain duke obtained from John Frederick, elector of Saxony, with great difficulty, permission to use a covered carriage in a journey to the baths, in which however much pomp was displayed; but with this express stipulation, that her attendants should not have the same indulgence. It is nevertheless certain that the emperor, kings, and princes, about the end of the fifteenth century began to employ covered carriages on journeys and afterwards on public solemnities.

Beckmann furnishes a quotation from a *Suite des Mémoires pour servir à l'histoire de Brandebourg*, a remark which seems to confirm this, that at the election of the emperor Matthias in 1594 the ambassador of Brandenburg had three coaches, which are described as coarse coaches composed of four boards put together in a clumsy manner; and it is added by the writer that the common use of carriages in

Brandenburg was not older than the time of John Sigismund. Towards the end of the sixteenth century, John of Finland, on his return from England, among other articles of luxury brought with him to Sweden the first coach. Before that period the greatest lords in Sweden, when they travelled by land, carried their wives with them on horseback. The princesses even travelled in that manner; and when it rained took with them a mantle of wax-cloth.

In 1550 it is said there were in Paris but three coaches—one belonging to the queen, another to the king's mistress, Diana of Poitiers, and the third to a corpulent nobleman René de Laval, lord of Bois-Dauphin; for although carriages were used at a very early period in France, it appears from all authorities that they were by no means common, and were seldom used even by the nobility. Henry IV. of France was assassinated in a coach, but he usually rode through the streets of Paris on horseback, and to provide against rain carried a large cloak behind him. For himself and his queen he had only one coach, as appears by a letter still preserved, in which he writes to a friend—"I cannot wait upon you to-day, because my wife is using my coach."

Roubo, in a costly treatise on joiners' work referred to by Beckmann, gives figures of such carriages (*chars*) as were used under this king of France, taken from drawings preserved in the king's library. By these it is seen that the

coaches were not suspended by straps, that they had a canopy supported by ornamental pillars, and that the whole body was surrounded by curtains of stuff or leather which could be drawn up.

The coach in which Louis XIV. made his public entrance about the middle of the seventeenth century appears from a drawing in the king's library to have been a suspended carriage.

OPPOSITION TO THE USE OF COACHES.

Like all inventions, which in time have proved to be of great benefit to mankind, coaches had to encounter considerable opposition.

This took a twofold form, for not only was it the case, as Beckmann states, that "the great lords at first imagined that they could suppress the use of coaches by prohibitions," but there was no inconsiderable outcry on the part of the people, based to some extent upon the "craft-in-danger" cry. As early as 1588 an order prohibiting the use of coaches was issued by Julius, Duke of Brunswick, and it is so interesting that it may be given in full. His vassals were forbidden to ride in coaches in the following terms:—"As we know from ancient historians, from the annals of heroic, honourable, and glorious achievements, and even by our own experience, that the respectable, steady, courageous, and spirited Germans were heretofore so much celebrated among all nations on account of their manly

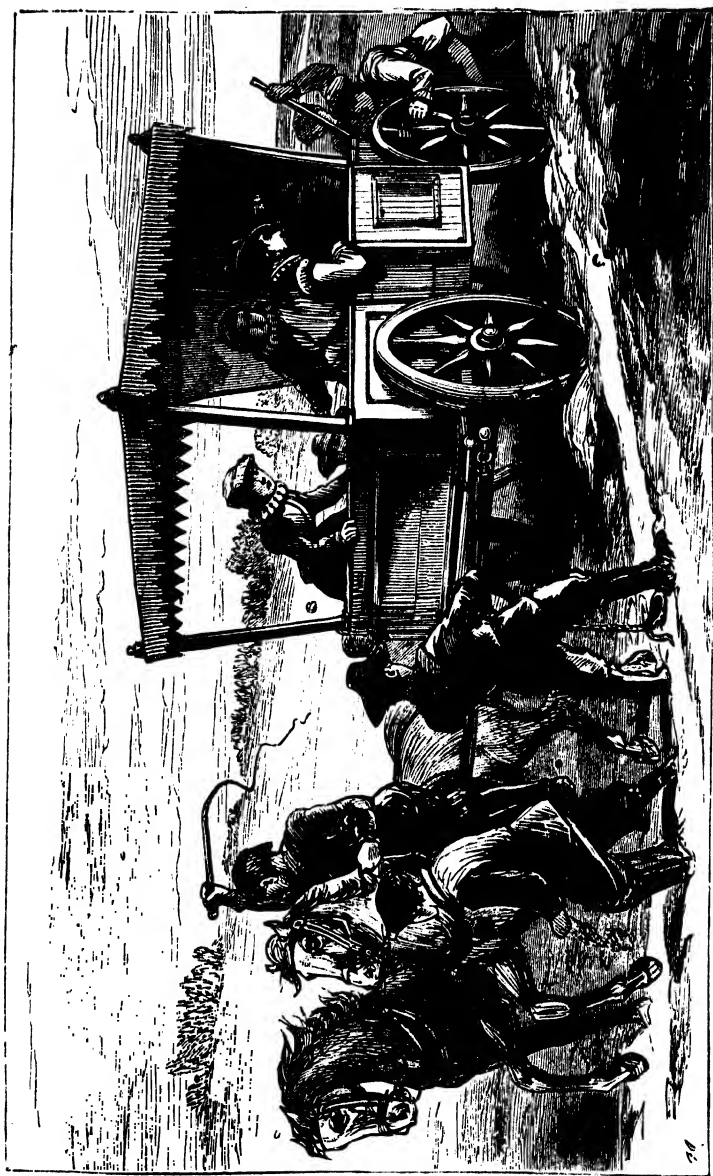
virtue, sincerity, boldness, honesty, and resolution, that their assistance was courted in time of war, and that in particular the people of this land, by their discipline and intrepidity both within and without the kingdom, acquired so much celebrity that foreign nations readily united with them, we have for some time past found with great pain and uneasiness that their useful discipline and skill in riding in our electorate county and lordship have not only visibly declined, but have been almost lost (and no doubt other electors and princes have experienced the same among their nobility); and as the principal cause of this is that our vassals, servants, and kinsmen, without distinction, young and old, have dared to give themselves up to indolence and to riding in coaches, and that few of them provide themselves with well-equipped riding-horses and with skilful experienced servants and boys acquainted with the roads; not being able to suffer any longer this neglect, and being desirous to revive the ancient Brunswick mode of riding handed down and bequeathed to us by our forefathers, we hereby will and command that all and each of our before-mentioned vassals, servants, and kinsmen, of whatever rank or condition, shall always keep in readiness as many riding-horses as they are obliged to serve us with by their fief or alliance; and shall have in their service experienced servants acquainted with the roads, and that they shall

have as many horses as possible with polished steel furniture, and with saddles proper for carrying the necessary arms and accoutrements, so that they may appear with them when necessity requires. We also will and command our before-mentioned vassals and servants to take notice that when we order them to assemble, either all together or in part, in times of turbulence, or to receive their fiefs, or when on other occasions they visit our court they shall not travel or appear in coaches but on their riding horses."

Beckmann also mentions that in the archives of the county of Mark (Germany) there is preserved an edict, in which the feudal nobility and vassals are forbid the use of coaches under pain of incurring the punishment of felony. Other forms of opposition to coaches will be found on a later page.

INTRODUCTION OF COACHES INTO BRITAIN.

After what has been said, the proper heading of this section should perhaps be the *re-introduction* of coaches into this country. However, the coach in its modern acceptation was new to Britain in the sixteenth century, and hence its history properly starts from that time. We need hardly treat as an exception to this conclusion the statement in a recent volume, that Henry Tudor, on 22d August 1485, "drove in a covered coach" to the entrance of St. Paul's after the battle of Redmere.



COACH—TIME OF QUEEN ELIZABETH.

One of the earliest records discoverable fixes the year 1553 as a period when coaches of some degree of magnificence were known in this country. On the last day of September in that year we learn that Queen Mary Tudor went in state from the Tower to Westminster in an open chariot drawn by six horses covered with cloth of tissue.

Stow, in his *Chronicles*, fixes the first use of coaches in England eleven years later. He says—"In the year 1564 William Boonen, a Dutchman, became the Queen's coachman, and was the first that brought the use of coaches into England. After a while divers great ladies, with as great jealousie of the Queen's displeasure, made their coaches and rid in them up and down the country, to the great admiration of all the beholders; but then by little and little they grew usuall among the nobilitie and others of sort, and within twenty years became a great trade in coach-making." The English were not slow to take up this trade, as it is stated that in the same year (1564) Walter Rippon made a *coche* for the Earl of Rutland, which was the first *coche* that was ever made in England. Speaking of a later period, Stow says—"The said Walter Rippon made the first hollow turning *coche*, with pillars and arches, for her majesty, being then her servant. Also in anno 1584, a chariot throne with foure pillars behind to beare a canopie, with a crowne

imperiall on the toppe, and before, two lower pillars, whereon stood a lion and a dragon, the supporters of the armes of England."

It has been stated by several writers, probably on the authority of Camden, but erroneously, as the preceding quotations show, that the invention of coaches was brought hither from France in 1580, and that the first ever publicly seen was the equipage of Henry Fitz-Alan, Earl of Arundel. It is further stated that this nobleman made a present of the same to Queen Elizabeth, who went in it from Somerset House to St. Paul's Cross in 1588, to return thanks on the destruction of the Spanish Armada. In the first engraved representation of an English coach, which bears the date 1582, Queen Elizabeth is represented seated in her coach, a curiously shaped and canopied vehicle, with feathers on the top, presenting an appearance between a triumphal car and a modern catafalque or open hearse. Taylor, the Water Poet, in *The World runnes on Wheeles*; or *Odds betwixt Carts and Coaches*, says, speaking of this carriage—"In the yeare 1564 one William Boonen, a Dutchman, brought first the use of coaches hither, and the said Boonen was Queen Elizabeth's coachman, for indeed a coach was a strange monster in those days, and the sight of them put both horse and man into amazement; some said it was a *great crab-shell brought out of China*, and some imagined it to be *one of the Pagan*

temples in which the cannibals adored the devil ; but at last their doubts were cleared, and coach-making became a substantial trade." The combined ideas of the crab-shell and the pagan temple are admirable as describing the form of this coach.

In the print above referred to is given a second coach, in which the queen's ladies are seated ; and this form of coach is represented by our illustration. The peculiarity of this carriage is the projecting seat between the wheels, named the *boot*, in which one person could sit. The Water Poet has a hit at this boot also, asserting that the coach, "like a perpetual cheater, wears two boots and no spurs, sometimes having two pair of legs in one boot ; and oftentimes, against nature, most preposterously, it makes fair ladies wear the boot. Moreover, it makes people imitate sea-crabs, in being drawn sideways, as they are when they sit in the boot of the coach." He also says "If you note, they are carried back to back, like people surprised by pirates, to be tied in that miserable manner and thrown overboard."

Towards the end of the sixteenth century the vehicles in use were divided into two classes, known by the respective names of *coaches* and *caroches*. The latter were larger and clumsier than the former, but were considered more stately. From an old play by Green (time of Elizabeth), entitled *Tu quoque*, we learn that a chariot was considered more appropriate

to the town, and probably to the court, while the coach was left for the country :—

Nay, for a need, out of his easy nature
May'st draw him to the keeping of a
coach

For country, and carroch for London.

Thus the "crab-shell" of the Queen may be held to represent the more showy and smaller vehicle for town use, while, as our illustration shows, the *caroche* ventured into the country roads, there duly to come to grief. Even in the city of London, the use of a coach was not all that could be considered pleasant or agreeable—the streets being, in the language of an early paving act, "very foul and full of pits and sloughs, very perilous and noyous."

A *Lover of his Country*, who published a pamphlet in 1673, furnishes in a series of questions an amusing picture of the condition of the roads towards the end of the seventeenth century. He asks, "Is it for a man's health to travel with tired jades, to be laid fast in the foul ways and forced to wade up to the knees in mire ; and afterwards to sit in the cold till teams of horses can be sent to pull the coach out ? Is it for their health to travel in rotten coaches, and to have their tackle, or perch, or axle-tree broken, and then to wait three or four hours, sometimes half a day, to have them mended, and then to travel all night to make good their stage ?" The "perch" would be the coachman's seat seen in vehicles of a somewhat later date than those in

the illustration. The necessity for several attendants on such a coach was obvious, and an allusion to this may be found in Ben Jonson's comedy, *The Devil is an Ass*, where it is said—

Have with them, for the great caroch,
 six horses|
 And the two coachmen, and with my
 ambler bare,
 And my three women.

And again, in Massinger's *City Madam*, the reference to a caroch drawn by six Flanders mares, with its "coachman, groom, postilion, footman," gives a fair idea of the retinue both of horses and men which the coaches and roads of that day entailed. Still, with all the expense of maintaining a coach and the obstacles the bad roads and streets presented to their use, the vehicles increased in number, and of course the satirists and the popular writers of the time had their own views as to this increase of ease and luxury. In the earliest years of the seventeenth century, parliamentary action against the use of carriages was demanded, and though a bill "to restrain the excessive use of coaches in this realme," introduced in 1601, was not carried into a law, the Attorney-General of the time was directed to look into the matter, and that "some fit bill touching the use of coaches" should be introduced to the notice of the House of Commons.

About the middle of the seventeenth century the practice of hiring out coaches was begun in London by Captain Bailly. A royal decree was issued in 1635,

in which hackney coaches were expressly forbid to be "used or suffered" in London or Westminster, unless they were to travel three miles out of the town, and it was further provided that no one should go in a coach in the streets unless the owner of the coach constantly maintained four able horses for the royal service when required. This rather high-handed order, though coming the year after hackney carriages were introduced, does not, however, appear to have had the effect of suppressing them or reducing their number. But the object of the proclamation may be judged from the reference to keeping horses for the royal service when required, and from an allusion to the destruction of the pavements and the enhancement of the price of forage.

While the coach had thus still to encounter suppressive efforts on the part of persons in authority, there are also evidences that in the minds of many persons the use of wheeled vehicles was immensely unpopular. The *Coach and Sedan pleasantly disputing together*, quoted in our chapters on sedan chairs, gives a print of the carriages of this period, which were oval in form, closed in on all sides, and furnished with cushions, as well as with leather blinds to close the windows. This closing of the carriage gave rise to curious imputations against them, and again the Water Poet may be quoted as expressing the feeling of a part of the people of the time. Taylor's opposition, though meant by him to express the views of the

people at large, has obviously the same character of "craft-in-danger" as has already been referred to. His *World runnes on Wheelles*, published in 1623, says, "I think never such an impudent, proud, saucy intruder came into the world as the coach is, for it hath driven many honest families to all misdeeds, hospitality to extortion, plenty to famine, compassion to oppression, and all earthly goodness almost to utter confusion." His great objection is to the "hackney hellcarts" as he describes them; "for in all my discourse I do not inveigh against any coaches that belong to persons of quality, but only against the caterpillar swarm of hirelings, who have undone my poor trade whereof I am a member."

In *Coach and Sedan* pleasantly disputing we have a similar argument from one whose craft was in danger:—"Coaches and sedans (quoth the waterman), they deserve both to be throwne into the Theames, and but for stopping the channell, I would they were; for I am sure where I was woont to have eight or tenne fares in a morning, I now scarce get two in a whole day; our wives and children at home are readie to pine, and some of us are faine for meanes to take other professions upon us."

The Water Poet argues "that a cart is like the emblem of a man, because it has two wheels, the coach being in like sense the resemblance of a beast, by which is parabolically demonstrated unto us

that as much as men are superior to beasts, so much are honest and needful carts more nobly to be regarded and esteemed above needless and time-troubling coaches." Evidently the carts offered no risk of opposition to the "poor trade" of the waterman poet!

As a further illustration of how this popular dislike of the new invention manifested itself, reference may be again made to the opinion of the *Lover of his Country*, who predicted serious woes to the trade of Britain if coaches were allowed to supersede horses. He says, "Before these coaches were set up, travellers rode on horseback; and men had boots, spurs, saddles, bridles, saddle-cloths, and good riding suits. Most gentlemen, before they travelled in their coaches, used to ride with swords, belts, pistols, holsters, portmanteaus, and hat-cases; for when they rode on horseback they rode in one suit, and carried another to wear when they came to their journey's end, or lay by the way. And if they were women that travelled, they needed to have safeguards and hoods, side-saddles and pillions, with strap-pings, saddle or pillion cloths, which for the most part were either laced or embroidered." The saving of much of this expenditure, by travelling in coaches, the writer held, would be the ruin of trade. "For formerly," he says, "every man that had occasion to travel many journeys yearly, or to ride up and down, kept horses for himself and his servants, and

seldom rid without one or two men." The attentive student of history will have little difficulty in deciding that he has heard something very like this argument on many occasions, as nearly every invention of value has had the same ordeal of imputed woes and dangers to pass through.

One advantage of coaches in towns—at least in towns like Paris and Edinburgh, where "gardy-loo" was in vogue—it has been left for a modern writer to discover. "After the development of the use of carriages, and their frequent employment by the court and nobility, the liberty to throw everything out of the window became intolerable. Thus the carriage of luxury has been the cause of the cleanliness of our streets." M. Ramée, in whose *Histoire des Voitures* this suggestion is found, is perhaps unconsciously forcing his facts to bear the relation he desires.

The earliest approach to the modern gig or cabriolet appears to have been made about the middle of this century, in the form of a chair fixed in a cart. Something of this style is represented in a MS. in the Imperial Library at Paris (1608), and copied in Mr. Thomas Wright's *Domestic Manners and Sentiments*. As the century advanced, however, the tendency was rather towards increasing than diminishing the size of the coach or simplifying the retinue required for it.

A hundred and twenty years after Queen Mary Tudor and her

ladies, with Princess Elizabeth and Anne of Cleves, went in coaches and six to Westminster in 1553, we have a notice of the use of a coach and six couched in such terms as showed that such a thing, though used on great state occasions long before, was not deemed a proper thing for ordinary use. The favourite Buckingham, who had served to introduce sedans, was also made the subject of remark and of emulation, because he first used a carriage and six. The act was looked upon as dictated by "mastering pride," but as the following extract shows, it led to the display of even more ostentation. Wilson, in his *Life and Reign of King James First*, tells that, "the stout old Earl of Northumberland, when he got loose, hearing that the great Favourite *Buckingham* was drawn about with a Coach and six horses (which was wondrous at then as a *novelty* and imputed to him as a *mastring pride*) thought if *Buckingham* had six he might very well have eight in his Coach, with which he rode through the City of *London* to the *Bath*, to the vulgar talk and admiration. . . . Nor did this addition of two horses by *Buckingham* grow higher than a little *murmur*. For in the late Queen's time there were no Coaches, and the first but two Horses; the rest crept in by *Degrees* as men at first venture to *sea*." Wilson was wrong in this statement that there were "no coaches" in Elizabeth's time, but he was probably correct if he meant no more than that

they were not commonly in use at that period. In view of the large number of horses that constantly figure in references to coaches and travelling about this period, it is well, however, to remember a remark made by Lord Macaulay in his sketch of the state of England in 1685. "The rich commonly travelled in their own carriages with at least four horses. . . A coach and six is in our time, never seen except as part of some pageant. The frequent mention, therefore, of such equipages in old books is likely to mislead us. We attribute to magnificence what was really the effect of a very disagreeable necessity. People, in the time of Charles the Second travelled with six horses, because with a smaller number there was great danger of sticking fast in the mire."

The following anecdote, preserved by the indefatigable Pepys, illustrates the novelty of the "glass-coach" about the middle of the seventeenth century:—
'My lady Peterborough being in her *glass coach* with the glass up, and seeing a lady pass by in a coach whom she would salute, the glass was so clear that she thought it had been open, and so ran her head through the glass.' Mr. Charles Knight, in his *London*, remarking on this incident, says, "This hints of the days when ladies were learning to ride in glass coaches, having just passed through the transition state of open coaches, and curtained coaches, and coaches with talc windows.

How ashamed the wife of John Gilpin would have been not to have known better!"

As the end of the century approached, the form of the coach was gradually modified, but the trappings were not less gorgeous than before. Davenant speaks of coaches of the time of Charles II. as "uneasily hung, and so narrow that I took them for sedans on wheels." A coach shown in the South Kensington Museum, and lent by the Earl of Darnley, is probably such a vehicle as Davenant here describes, though it is catalogued as of English make, early in the eighteenth century. Carved in solid wood, it is hung on leathern straps, with cross straps to prevent a jostling motion. It looks indeed like a sedan chair on wheels. The royal arms on the door, the painted panels above, and the series of gilt crowns on the top, point it out as at one time a vehicle of high degree. But all its carving, its richly painted and gilt wheels, and its sumptuous interior, make up but slightly for its clumsiness of build and extreme length.

Coaches of 1688 and 1696 are found in old engravings; the former in Romain de Hooge's representation of William III. entering the royal palace of Whitehall, and the latter in a print in the British Museum. In the latter the square straight top and the heavy wheels are not suggestive of grace, but the open curtained sides, the shaped lower part of the carriage, and the simple style of decoration

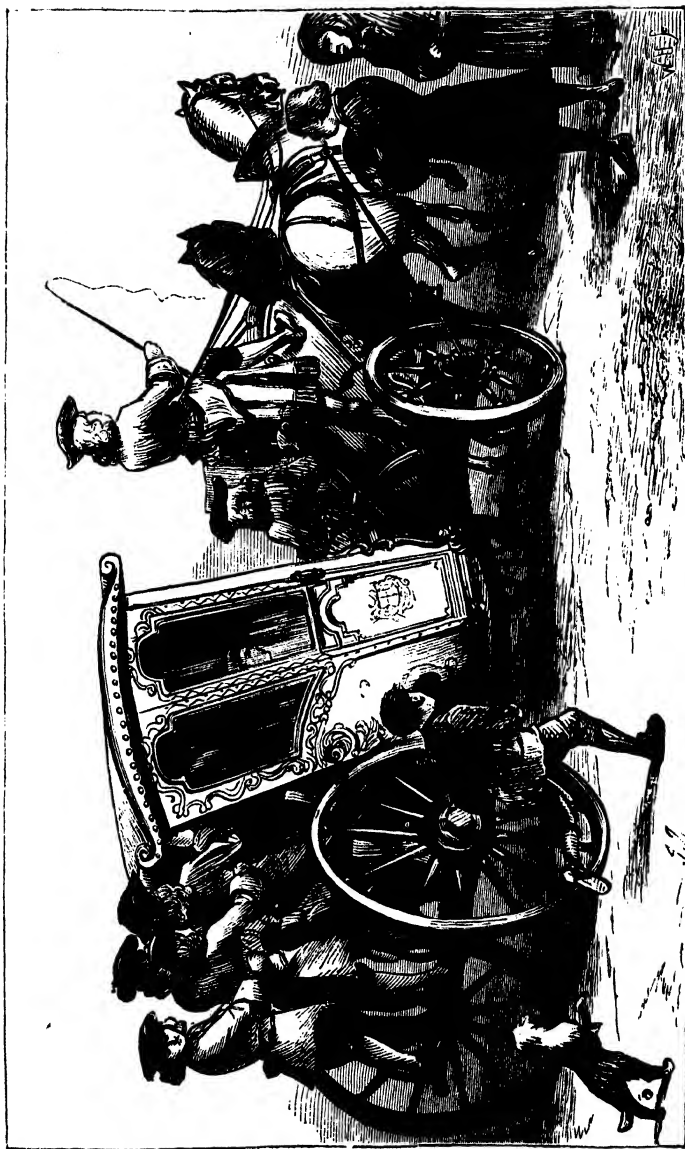
—merely rows of brass nails marking the lines of the framework—indicate a considerable advance on the earlier vehicles.

Notwithstanding the legal and popular opposition to coaches, the earlier half of the century saw as many as six thousand coaches kept in London and its neighbourhood; and so important did the business become, that in 1669 King Charles II. granted a charter incorporating the Worshipful Company of Coach and Coach-harness Makers, in the city of London, conferring on them certain privileges and rights, in order to encourage and protect a trade that

had not been very long established, and was thought to require support.¹ In Scotland, the making of coaches was also the subject of State favour in the later years of the century, as we learn from the records of the Scottish Convention of Estates or Parliament that in 1693 an Act was passed giving to one William Scott certain privileges for making “coaches, chariots, sedans, coach harness, and glasses.”

¹ This company still exists, and in February 1865 granted the use of its hall to enable the carriage workmen of London to hold an exhibition of their handicraft, at the same time rewarding the most skilful with handsome bronze medals.





PRIVATE CARRIAGE—EIGHTEENTH CENTURY.



CHAPTER II.

This Coach that with the blazoned 'scutcheon glows,
Vain of his unknown race the coxcomb shows.

GAY, *Trivia*, Book ii. 577-8.

COACHES IN THE EIGHTEENTH CENTURY—CHANGES OF FORM—COACHES IN SCOTLAND—A COACHMAN'S ACCOUNT FOR OUTLAYS—STATE OF THE ROADS—SPEED OF TRAVELLING—ROADS IN SCOTLAND—THE PLEASURES AND DANGERS OF COACH TRAVELLING.

COACHES IN THE EIGHTEENTH CENTURY.

THE coach as a means of locomotion probably reached its culmination towards the end of the century on which we now enter, not so much from the improvement and lightening of the form of the coach, which was reserved for our own day, as from the fact that some progress had been made in the construction of improved roads. The literature of the century is filled with references to the coach, now as the type of extravagance, again as the index of wealth or the result of suddenly or unscrupulously acquired wealth, at another time as the evidence of refinement and progress, or as the representative of enjoyment and pleasure. A great deal can be learnt of the history of an age from its poems, particularly those of a satirical nature, and the history of coaches might be illustrated from this source not less copiously than has been done with the history of the sedan.

The increase of coaches early last century was in many cases looked upon merely as the evidence of extravagance or upstart wealth. Gay, for example, says in the poem so frequently quoted in earlier pages :—

Now gaudy pride corrupts the lavish age,
And the streets flame with glaring equipage.

The tricking gamester insolently rides,
With *Loves* and *Graces* on his chariot's sides.

In saucy state the griping broker sits,
And laughs at honesty and trudging wits.

While incidentally, in Swift's quasi-classical satire of *Apollo, or the Problem solved*, we have a somewhat similar reference :—

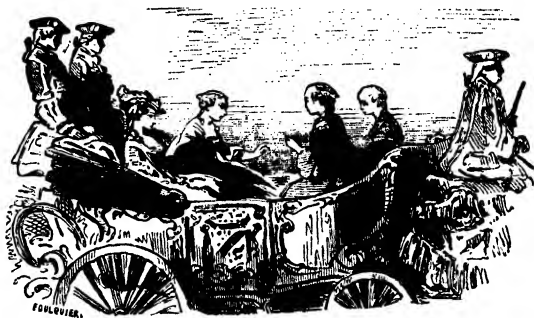
No heir upon his first appearance,
With Twenty thousand pounds a year rents

E'er drove, before he sold his land,
So fine a coach along the Strand.
The spokes, we are by Ovid told,
Were silver, and the axle gold ;
I own 'twas but a coach and four,
For Jupiter allows no more.

"About five-and-twenty years ago," says Smollett in *Humphrey Clinker*; writing of a later period, "very few even of the most opulent citizens of London kept any equipage, or even any servants in livery. Their tables produced nothing but plain boiled and roasted, with a bottle of port and a tankard of beer. At present every trader in any degree of credit, every broker and attorney, maintains a couple of footmen, a

coachman, and postilion. He has his town-house and his country-house, his coach, and his post-chaise. His wife and daughters appear in the richest stuffs, bespangled with diamonds. They frequent the court, the opera, the theatre, and the masquerade. . . .

"In short, there is no distinction or subordination left. The different departments of life are jumbled together—the hod-carrier, the low mechanic, the



tapster, the publican, the shop-keeper, the pettifogger, the citizen, and courtier, *all tread upon the kibes of one another*; actuated by the demons of profligacy and licentiousness, they are seen everywhere, rambling, riding, rolling, rushing, justling, mixing, bouncing, cracking, and crashing, in one vile ferment of stupidity and corruption—all is tumult and hurry. One would imagine they were impelled by some disorder of the brain, that will not suffer

them to be at rest. The foot-passengers run along as if they were pursued by bailiffs. The porters and chairmen trot with their burdens. People who keep their own equipages drive through the streets at full speed. Even citizens, physicians, and apothecaries glide in their chariots like lightning. The hackney coachmen make their horses smoke, and the pavement shakes under them; and I have actually seen a waggon pass through Piccadilly at the

hand-gallop. In a word, the whole nation seems to be running out of their wits."

In the next letter the crowded thoroughfares of London are thus described :—

"I at first imagined that some great assembly was just dismissed, and wanted to stand aside till the multitude should pass ; but this human tide continues to flow, without interruption or abatement, from morn till night. Then there is such an infinity of gay equipages, coaches, chariots, chaises, and other carriages, continually rolling and shifting before your eyes, that one's head grows giddy looking at them ; and the imagination is quite confounded with splendour and variety."

One of the neatest retorts on record by one of the "carriage people" in the early part of the century is to be found in Captain Birt's *Letters from the North of Scotland*, written in 1726. He says, "I was once commending, to a lady of fortune in *London*, the upright, firm, yet easy Manner of the ladies Walking in *Edinburgh*. And when I had done, she fluttered her fan, and with a kind of Disdain, mixed with Jealousy, to hear them commended, she said, 'Mr.——, I do not at all wonder at that, they are used to walk.'" Thus the "gig respectability" of a century and a half ago looked down upon those who had not been successful in reaching what was looked on as so distinctly the index of wealth and position.

The coach had not all its own way, however, in this century more

than before. "If we have no *Lover of his Country* to dilate on the ruined trade which would follow the substitution of wheeled vehicles for horses as a means of travel, we have in John Gay at least one sturdy upholder of the dignity of the pedestrian art. Thus, again reverting to his *Trivia*, we have a diatribe on the obstructions cast in the way of the pedestrian by the aggressive coach-drivers, in which he asks :—

What walker shall his mean ambition fix
On the false lustre of a coach and six ?

and, scorning the arts by which many have reached the coveted luxury, he breaks out into an apostrophe, in which the quaint conjunction of "virtue and a good surtout" is inimitable :—

May the proud chariot never be my fate,
If purchased at so mean, so dear a rate.
O rather give me sweet content on foot,
Wrapt in my virtue and a good surtout !

The converse of the picture may also be observed in the case of the economical fop described in an earlier part of the poem :—

At every step he dreads the wall to
lose
And risks, to save a coach, his red-
heeled shoes ;

while a very admirable reason for the use of a coach may be found in the following story by persons who are not what Johnson called "pedestriously" inclined, or by any one who has encountered the dangers of a promenade in Regent Street in company with his wife :—
Les Lespès, the brilliant French

writer, tells why the fashionable seldom or never go on foot. The custom was introduced by Count d'Alton-Shee, and had the following origin :—One day he was walking in Paris with a young lady who suddenly said, "Oh, what a charming bracelet ! Look there, my friend." So he bought

it. A little farther on she saw a fan. "Ah, what a lovely fan !" quoth she. He bought it. A little farther on she saw an ebony casket. "Ah, what a casket !" said she, "I've wanted just such a one ever so long !" How could he help buying it ? The next day the Count said to himself, "I will



always take a cabriolet ; it will not cost so much as walking."

Some popular clamour arose in this century against coaches as *destroying the roads*, as readers of Smollett's "Continuation" may remember. He tells us that petitions from various parts of England were presented to Parliament in 1759, with reference to the compulsory use of broad wheels, and the *limitation of the number of horses used in drawing carriages with narrow wheels*. In Committee

the House resolved to limit the weight on waggons and carts, but representations were made that such a bill, if passed into a law, would render it impossible to bring fresh provisions from Suffolk, etc., into London, as the supply depended absolutely on the quickness of conveyance. And thus ended this attempt, quoted as an illustration of many similar, to suppress or oppress the growing coach.

Reference has been made to the prevalence of coaches as the index

of wealth ; and as the argument tells both ways, a decrease in their number is quoted, by writers in last century, as evidence of distress, slack trade, and high prices. One illustration of this may suffice, quoted from the great storehouse of pictures of society during last century, namely, the letters of Horace Walpole. Writing in 1778, he says :—

“ Distress is already felt ; one hears of nothing but of the want of money ; one sees it every hour. I sit in my blue window and miss nine in ten of the carriages that used to pass before it. . . . Richmond is deserted ; an hundred and twenty coaches used to be counted at the church door, there are now twenty.”

One class of society has, during last century and down to this day, looked upon the possession of a coach as the proper mark of success in their profession, to wit, the doctors. The natty little brougham or “ pill-box,” or the light two-horse chariot of our time, did not suit the physician of the beginning of last century. We read in Mr. Jeaffreson’s *Book about Doctors*, that, previous to Charles II.’s reign, physicians were in the habit of visiting their patients on horseback, sitting sideways on foot-cloths like women. Simeon Fox and Dr. Argent were the last presidents of the College of Physicians to go their rounds in this undignified manner. With the Restoration, however, came the carriage of the London physician, who either was, or wished to be,

successful. And in Queen Anne’s reign no physician with the slightest pretensions to practice could manage without his chariot and four, sometimes even six horses.

Mr. Jeaffreson gives the following anecdote of a lady doctor of last century in his description of the bone-setter, Mrs. Mapp, who resided in Epsom, but visited London once a week in a chariot drawn by four horses, with servants wearing splendid liveries. On one occasion a crowd assembled round her carriage in the old Kent Road, her “ fat frame, indecorous dress, intoxication, and dazzling equipage,” causing her to be mistaken for Madame Keilmansegge, a lady of the court of George I. The crowd was about to break the windows with stones when the occupant of the carriage, letting down the glasses, exclaimed, with an imprecation, “ Don’t you know me ? I am Mrs. Mapp, the bone-setter ;” when she was allowed to proceed, amidst cheers and laughter.

The gorgeous style of driving about on professional calls does not appear to have lasted long, at least amongst the French physicians, regarding whom a curious memento is preserved in a recently published book. In this volume, the gorgeously illustrated *XVIII^{me} Siècle* of Paul La Croix, there is an interesting *composition allégorique* showing the carriage of Tronchin, the *medecin à la mode*. This is a two-horse carriage, without a hammercloth

upon the driver's seat, and having the body of the coach (which was hung on straps) like that of a sedan chair of the later shape, only seated for two. All Paris had praised the beneficence of Tronchin, who consecrated regularly two hours a day to those who called at his "*bureau de philanthropie*." He not only gave consultations to the poor gratis, but gave them the money necessary to procure the medicine. In caricature of his great success, the *medecin à la mode* is represented running over one of his rivals—*ecrasant ses rivaux*—and the print is interesting as showing the kind of carriage used by the French physician of a hundred years ago.

The author of the *Book about Doctors* thus writes on the physician's coach:—"In our own day an equipage of some sort is considered so necessary an appendage to a medical practitioner, that a physician without a carriage is looked on with suspicion. . . . On the whole the carriage system is a good one. It protects stair carpets from being soiled with muddy boots (a great thing !) and bears cruelly on needy aspirants after professional employments (a yet greater thing !), and one that manifestly ought to be the object of all professional etiquette. If the early struggles of many fashionable physicians were fully and courageously written, we should have some fine stories of the screwing and scraping and shifts by which their first equipages were main-

tained. Heart-rending stories,—and yet so funny !" He goes on to tell of one doctor, who taught singing, under the guise of an Italian Count, at a girls' school at Clapham, and of another who procured the means of keeping a brougham, during the day, by acting as driver of the brougham in the hours of darkness ; and whose secret was discovered, when he forgot himself one day and jumped in when he should have jumped on, or the reverse. He tells also of one ambitious doctor who came out in "an equipage fit for an ambassador,—the vehicle and the steeds being obtained, like the arms blazoned on his panels, on credit," and who, when afterwards seen walking the streets, told his friends that Sir James Clarke had prescribed continuous walking exercise as the only means of recovering his powers of digestion. "His friends—good-natured people, as friends always are—observed that it was a pity Sir James hadn't given him the advice a few years earlier, prevention being better than cure."

CHANGES OF FORM.

The illustration at the beginning of this chapter is that of a form of carriage prevalent in the first quarter of the eighteenth century, and differs considerably from those seen later on in that century. The backward slope of the carriage is very remarkable, but this peculiarity is not seen in many contemporary prints. In a print mentioned

by Mr. Fairholt in his papers on "English Carriages" in the *Art Union* for 1847, the square heavy form of coach prevalent in the previous century is shown to have subsisted during part of this period. The print referred to represents the procession of Parliament to St. Paul's in 1713, to the public thanksgiving for the peace of Utrecht. The "uncomfortable mob" of footmen hanging on the back of these coaches is not entirely unknown in our own day in cases of state and pageantry, so that we may well inquire if we have really as much improved from the ways of our forefathers as our self-satisfaction would make us believe. The reason the coaches of this period required so many attendants is not far to seek, when the badness of the roads, the foul and rutty streets, and the ponderous weight of the conveyance, are considered. An obvious conclusion from the weight and the crowd of men is that the speed of the coach could not have been great, so that the "running footmen," of whom so much may be read in olden times, were not perhaps so fleet of foot as the name would suggest. So long as the roads and streets were so bad it was not such a great achievement that a man should act as described in *Titus Andronicus*, and

By the waggon wheel,
Trot like a servile footman all day long,
Even from Hyperion's rising in the east
Until his very downfall in the sea.

A letter quoted by Mr. Fairholt in the papers referred to shows

us one servant of a nobleman in London instructing another in Sussex that their master is about to leave town, and desiring him to have the "keepers and persons who know the holes and the sloughs," to meet their master "with lanthorns and long poles" to help him on his way. This was for the portion of the journey where there were really no roads; but, as we shall see in a future page, the condition of the roads where they did exist was such as to make the presence of a goodly retinue of helpers on the back of each coach a matter of necessity.

Towards the middle of the century there arose many modifications of the form of coach, the fixed heavy framework giving way to the "barouche" or "berlin" form of carriage, the latter alleged to take its name from the city of Berlin, and to have been invented in the middle of the previous century. Not long after this time seems to have been seen in England for the first time the one-horse gig, a clumsy enough vehicle in its first introduction, but without doubt the parent of every form of two-wheeled car, gig, dog-cart, or "whitechapel" that has since been seen. The ancestor of this gig may perhaps be found in the "chair fixed to a cart" referred to in a former chapter, but the gig of last century was at least the immediate parent of all modern *open* vehicles of two wheels. Curious old prints make us familiar, however, with a closed square and

springless vehicle, the brouette or wheeled sedan, drawn by a horse; and Sterne, in a memorable chapter of his *Sentimental Journey*, in which not the modes but the "final causes" of travelling are treated, speaks of drawing the taffeta curtain of the old *Désobligeant*, a vehicle which was so

called because it carried only one inside. As the coach approaches nearer and nearer to the forms with which our eyes are familiar, the necessity to describe them in detail decreases, and we may conclude with the annexed illustration of a coach with leather straps and a "barouche" hood,



illustrating the form at the end of last century or the earlier years of that in which we live.

Efforts to reduce the retinue which a coach so often entailed were made, and a mechanical contrivance, of short-lived existence was introduced at the end of the century. This was the invention of a Mr. Thomason, who "added to the convenience of the higher ranks by his improvement of the steps to carriages, which fold up and let down by the action of opening and shutting the carriage door." The advantage of this improvement was stated to be that a gentleman might

travel commodiously without a servant behind, or without the driver quitting his horses; and in case the driver should be thrown from his horse, or the horses become vicious, the person in the carriage might let himself out without any danger.

COACHES IN SCOTLAND.

While coaches were so prevalent and retinues so numerous in the southern part of the kingdom, coaches were few in number, and even wholly unknown in some parts of Scotland early in last century.

Mr. Markland, in his papers in *Archæologia*, quotes the authority of Sir Walter Scott for a tradition that chaises or chariots were first introduced into Scotland in 1745. We have already seen in the statutory privilege given to William Scott in 1693 to build coaches in Scotland, that this is an obvious error. Forty years before the last date, the Scots Parliament ordered that two travelling coaches, prepared for the use of the commissioners who went to London to treat with the English Parliament on the subject of Charles I, should be "delivered to Daniel Earle for the use of Lord Whitelock." In 1673 there were, it is stated, twenty hackney coaches in Edinburgh; and in 1700, when the Duke of Queensberry came to Edinburgh as King's Commissioner, he was met by a train of forty coaches, mostly drawn by six horses.

We are furnished with some interesting information on this subject by a writer in the *Scots Magazine* for 1817, who, in a *View of the Change of Manners in Scotland during the last Century*, remarks—"One man-servant was thought sufficient for most families, or two at most, unless they kept a carriage, which was a very uncommon thing in those days, and only used by nobles of great fortune." From Captain Birt's *Letters from the North of Scotland* in 1726, we obtain evidence that coaches were practically unknown, and that the people held such views regarding them as have

not unfrequently been observed in semi-civilised or uncivilised nations. Captain Birt says—"Since the making of some of the Roads, I have passed through them with a Friend, and was greatly delighted to see the Highlanders run from their Huts close to the Chariot, and looking up, bow with their Bonnets to the Coachman, little regarding us that were within. 'Tis not unlikely they looked upon him as a kind of Prime Minister that guided so important a machine . . . and therefore their addresses were directed to the Minister, at least in the first place, for Motion would not allow us to see a second Bow, if they were inclined to make it." Again he says—"I was entertained with the Surprise and Amusement of the Common People of this Town, when in the year 1725 a Chariot with six monstrous great Horses arrived here by Way of the Sea Coast. An Elephant publicly exhibited in the Streets of London could not have excited greater Admiration. One asked what the Chariot was; another, who had seen the gentlemen alight, told the first with a Sneer at his Ignorance, it was a great cart to carry people in, and such like." Even half a century later there were few coaches in Scotland; and as readers of Johnson's *Tour to the Hebrides* may remember, most of his peregrinations through Scotland were on horseback. Here is how Johnson and Boswell welcomed a return to "civilisation." "We

were favoured with Sir James Colquhoun's coach. . . . Our satisfaction of finding ourselves again in a comfortable carriage was very great; we had a pleasing conviction of the commodiousness of civilisation, and heartily laughed at the ravings of those absurd visionaries who have attempted to persuade us of the superior advantages of a state of nature." This was after two months of rough riding on horseback, or being tossed in open boats,—what Boswell in another place calls "the universal medium of connection amongst mankind."

Perhaps it was not wholly a superiority to current frivolity that made Lord Monboddo, a well-known member of the Scottish Bench, persist in travelling on horseback, scorning a carriage on the ground of its being unmanly to "sit in a box drawn by brutes." When he went to London, as Dean Ramsay relates, he rode the whole way. At the same period, Mr. Barclay of Ury, when he represented Kincardineshire in Parliament, always *walked* to London. He was a very powerful man, and could walk fifty miles a day, his usual refreshment on the road being a bottle of port wine poured into a bowl and drunk off at a draught. "I have heard," says Dean Ramsay, "that George III. was much interested at these performances, and said, 'I ought to be proud of my Scottish subjects, when my judges *ride* and my members of Parliament *walk* to the metropolis.'"

Here we may quote a curious advertisement in the *Glasgow Journal* of 8th September 1763, in which "a gentleman, going to London from Edinburgh in a post-chaise," announces that he "wants a companion." Apparently neither of the two cities could boast of two men wanting to go to London at one time!

A COACHMAN'S ACCOUNT FOR OUTLAYS.

We have not sought to collect information as to the comparative cost of keeping a carriage in former times and in our own day. The following account, however, is interesting, not only from what it shows to have been sufficient "board wages" for a travelling servant in the middle of last century, but as pointing out the fact that a Scotch family of distinction in 1753 had more than one carriage, mention being made in the coachman's bill of both a "coach" and a "cheas," while the difference in the toll-rate paid for these shows them to have been different vehicles. The account, which is here reprinted from the original manuscript in the possession of an Edinburgh gentleman, is as follows:—

An Account of Burdwedgs and
Monie payed out for Mr.
A—— W—— of N——.

1753.	Shill.	Pee.
Aug. 1. To Turnpike for the Cheas	0	1
2. To Drogs for the hempie Dog	0	9
3. To Burdwedgs in Bdr.	0	6

		Shill.	Pen.
Aug. 10.	To Burdweds in Edr.	0	6
11.	To Turnpike for on hors	0	0½
12.	To Turnpike for the Cheas	0	1½
14.	To a spear for the Coah wheel at Calder . . .	0	2
15.	To Turnpike for on hors	0	0½
20.	To Burdweds in Edr.	0	6
Sept. 17.	To Turnpike for the Cheas	0	1½
25.	To Turnpike for the Cheas	0	1½
26.	To Burdweds in Edr.	0	6
28.	To Turnpike for the Cheas	0	1½
29.	To Turnpike for on hors	0	0½
Oct. 1.	To Turnpike for the Cheas	0	1½
15.	To hors Shous fastin- ing at Makerstown . .	0	6
22.	To four Removs at Makerstown	0	6
25.	To Grees for the Coah at Yeatholm	0	6
Nov. 1.	To on Show at Twin- ham	0	6
	To Ditt at hadingtown on Show	0	6
	To Ditt at Drommors Park for Turnpike . .	0	2½
9.	To Turnpike for five horses at Drommors Park	0	2½
16.	To Burdweds in Edr.	0	6
20.	To Burdweds in Edr.	0	6
Dec. 13.	To Burdweds in Edr.	0	6
	To Ditt on Oyle Brush .	0	10
26.	To Turnpike for the Cheas	0	1½
27.	To Turnpike for the Cheas	0	1½
1754.			
Jan. 12.	To Burdweds in Edr.	0	6
Feb. 5.	To Turnpike for on hors	0	0½
16.	To Burdweds in Edr.	0	6
Mch. 12.	To Burdweds in Edr.	0	6
Aprill 5.	To Turnpike for the Coah	0	2
6.	To Turnpike for the Coah	0	2

	Shill.	Pen.
Aprill 8.	To Turnpike for the Coah	0 2
11.	To Turnpike for the Coah	0 2
21.	To Turnpike for the Cheas	0 1½

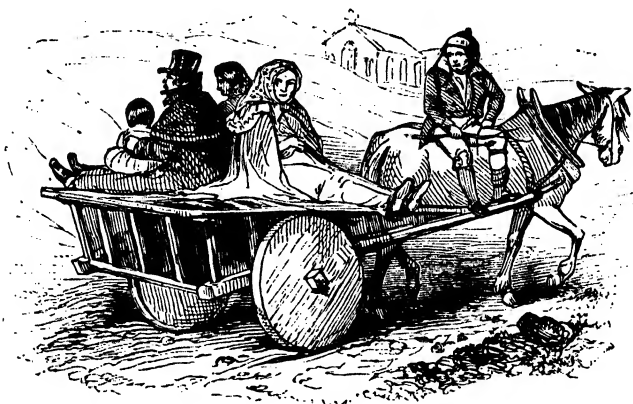
June the 2d, 1754. 11 7
 Received the above and Discharges the
 Saim and all Prosidings by
 W— S—.

The account, notwithstanding the extraordinary spelling, is well written, and it is endorsed in a different hand—"Acct. Wm. S— coachman, board wages and other debursts, from August 11th, 1753, to Whitsdy 1754, 11sh. 7d." The reference to the discharge of all "prosidings," would seem to indicate that the account had been disputed, perhaps the claim for "burd wedgs" in Edinburgh, may have been considered extreme at 6d. a day! The cost of one horse-shoe ("on show" in the account) appears to have been the same as that for a day's board of a man, while the drugs for a sick dog and the "oyle" brush far exceed that charge.

What the condition of Ireland was in respect to coaches almost defies research. We have obtained one illustration of a very rude Irish car, which seems almost identical with the old car already mentioned as shown in the Cottonian MSS., and described by Strutt as a large long flat board made fast on an axle-tree supported by two wheels.

STATE OF THE ROADS.

The power of using carriages with comfort to the occupants



depends so much on the condition of the roads, that it will be convenient here to give some more detailed notice of the highways in Britain during last century. One of the best descriptions of the difficulties and obstacles encountered during a journey about the close of the seventeenth century is that given by Vanbrugh, in his *Provoked Husband*, where the narrative is doubtless as faithful as it is amusing. The following scene describes the progress of a family from Yorkshire, in their own carriage, to London :—

Lord Townly. Mr. Moody, your servant; I am glad to see you in London. I hope all the family is well.

John Moody. Thanks be praised, your honour, they are all in pretty good heart, tho' we have had a power of crosses upo' the road.

Lady Grace. I hope my Lady has no hurt, Mr. Moody.

John Moody. No, an't please your ladyship, she was never in better humour: There's money enough stirring now.

Manly. What has been the matter, John?

John Moody. Why, we came up in such a hurry, you mun think that our tackle was not so tight as it should be.

Manly. Come, tell us all: pray how do they travel?

John Moody. Why i' the auld coach, Menster; and cause my Lady loves to do things handsome, to be sure, she would have a couple of cart horses clapt to th' four old geldings, that neighbours might see she went up to London in her coach and six! And so Giles Joulter, the ploughman, rides postilion!

Lord Townly. And when do you expect them here, John?

John Moody. Why, we were in hopes to ha' come yesterday, an' it had no' been that th' owld wheaze-belly horse tired; and then we were so cruelly loaden, that the two fore-wheels came crash down at once in Waggon-Rut Lane; and there we lost four hours 'fore we could set things to rights again.

Manly. So they bring all their baggage with the coach then?

John Moody. Ay, ay, and good store on't there is. Why, my Lady's gear alone were as much as filled four portmantel trunks, besides the great deal box that heavy Ralph and the monkey sit on behind.

Lord Townly, Lady Grace, and Manly. Ha! Ha! Ha!

Lady Grace. Well, Mr. Moody, and pray how many are they within the coach?

John Moody. Why, there's my Lady and his Worship, and the young squore, and Miss Jenny, and the fat lap-dog, and my lady's maid Mrs. Handy, and Doll Tripe the cook; that's all. Only Doll puked a little with riding backward, so they hoisted her into the coach-box, and then her stomach was easy.

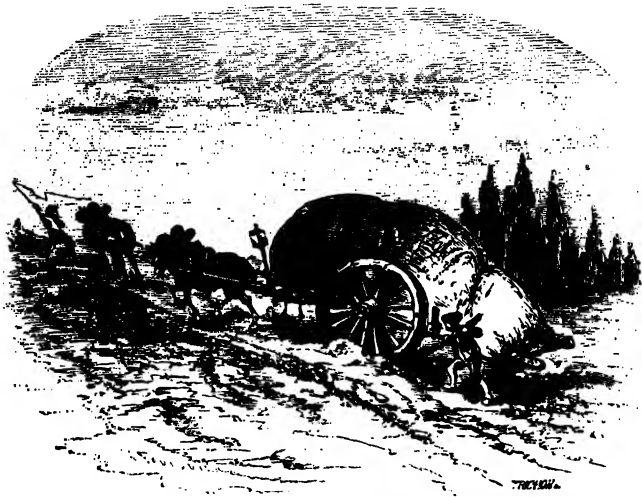
Lady Grace. Oh! I see 'em, I see 'em go by me. Ah! ha!

John Moody. Then you mun think,

measter, there was some stowage for the belly, as well as th' back too; such cargoes of plum cake, and baskets of tongues, and biscuits and cheese, and cold boiled beef, and then in case of sickness, bottles of cherry-brandy, plague-water, sack, tent, and strong beer, so plenty as made the owld coach crack again! Mercy upon 'em! and send 'em all well to town, I say.

Manly. Ay! and well out on't again, John.

John Moody. Ods bud! measter, you're a wise mon; and for that matter, so am I. Whoam's whoam, I say; I'm sure we got but little good e'er sin' we turned our backs on't.



Nothing but mischief! Some devil's trick or other plagued us, aw th' day lung. Crack goes one thing; Bawnee goes another. Woa, says Roger. Then souse! we are all set fast in a sleugh. Whaw! cries Miss; scream go the maids; and bawl! just as thof they were struck! And so, mercy on us! this was the trade from morning to night.

In the previous century the roads were, doubtless, worse. Of the period about 1526 it has been recorded that in "the dreadful state of the roads at that time, a state which continued with little amendment till the introduction of post carriages and horses, to-

gether with their concomitants the tollbars, winter journeys to London were formidable undertakings." This was written *apropos* of the journey to London of Harry Clifford, on his creation as Earl of Cumberland, a nobleman who at his death bequeathed 100 marks to be bestowed on the highways in Craven, and the same sum on those of Westmoreland,—“a testamentary bounty,” says Mr. Markland, in quoting the incident, “which proceeded from a personal feeling for its necessity.” John Lyon, the founder of Harrow School, dying in 1592, bequeathed the rents and profits of certain lands to be expended in repairing the roads from Edgeware and Harrow to London; while Sutton, the founder of the Charter House, who died in 1611, bequeathed various sums for amending the highways between Islington and Newington, and elsewhere.

The construction of roads remains to this day much in the same position of difficulty that it did some centuries ago—that is, as regards the persons by whom the roads should be made and maintained, and the method of raising the necessary money for doing this. The science of road-making and its application as an art have made great advances, but no student of the subject can affirm that we have, either in the toll system or the assessment system, reached a perfect method of ensuring that those who use the roads and those who benefit by the roads should pay for them.

The laws as to road-making are thus epitomised by MacCulloch in his *British Empire*:—

“Highways of one sort or another must, of course, exist in every country emerged from barbarism; but in England, the statute 2 and 3 Philip and Mary, c. 8, is the first legislative enactment in which a regular provision was made for the repair of the roads. At common law every parish was bound to keep the roads that intersect it in good serviceable condition. But until the epoch now mentioned, this duty, not being devolved upon any particular person, was very much neglected. The preamble to the Act of Philip and Mary declares that the roads were tedious and noisome to travel on, and dangerous to passengers and carriages; and therefore it enacts that in every parish two surveyors of the highways shall be annually chosen by the inhabitants in vestry assembled, and that the inhabitants of all parishes shall be obliged, according to their respective ability, to provide labourers, carriages, tools, etc., for *four* days each year, to work upon the roads under the orders of the surveyors. This system, though in many respects defective, was justly regarded at the time as a very great improvement. The great lines of road have indeed been long exempted from its operation; but the construction, repair, and the police of the cross or parish roads through England continue to this day to be re-

gulated on the principles laid down in the above Act.

"The plan of making and repairing roads by contributions of forced labour, though established in most other European countries, as well as in England, is, in all respects, one of the worst that can be imagined. Its defects were long since perceived, and individuals subject to such contribution were allowed to compound with the surveyors on payment of certain rates. This system is now, however, wholly abandoned. . . . The system established by the Act of Philip and Mary was improved and consolidated by Acts passed in the reigns of Elizabeth and James I., and for a time answered pretty well. But the great increase of wealth and population that took place during the reigns of James I. and of Charles I. and II. having led to a great increase of travelling, and the employment of many pack-horses, wheel-carriages, etc., the old system was found to be quite inadequate for the keeping up and repair of the great roads, particularly in the vicinity of London . . . and it was not till after the peace of Paris, in 1763, that turnpike roads began to be extended to all parts of the kingdom; and that the means of internal communication began, in consequence, to be signally improved. The turnpike roads of England and Wales extend, at present (1839) to the distance of above 23,000 miles!"

Many arguments could be adduced in favour of making the

construction of roads a national business,—national either through direct action, or by the provision of a central machinery for seeing that the roads are properly made and maintained. Writing of a period of forty years ago, the following remarks of MacCulloch remain of great force down to our own day :—

"Though vastly improved, as compared with their condition about the middle of last century, when, indeed, they were in various places all but impracticable for wheeled carriages, many of the turnpike roads continued down to a very late period to be, and some are still, in a very bad state. Recently, however, they have been much improved; and a few have been constructed on the most approved principles. The road from London to Holyhead is one of these, and is, without doubt, the best in the kingdom. It was not formed under the superintendence of road trustees, but of parliamentary commissioners appointed for the purpose, who employed Mr. Telford as their engineer. But, with this and a few other exceptions, most of the existing roads are far from being in the state that might be expected, and in which, indeed, they ought to be. The principal defect consists in their unevenness, for, instead of being carried round, they are, even where the distance saved is nothing or but inconsiderable, mostly carried over hills."

The defects of roads in our

own day, the sources of many of the evils of bad roads, and the principles which should guide the road-maker, are very well set forth by Sir Henry Parnell in his *Treatise on Roads*, from which the following extract, referring to the year 1839, is as applicable in a retrospect of the bad roads under which our ancestors suffered, as in the connection in which the words were penned :—

“The breadth of a road is seldom defined to a regular number of feet by straight and regular boundaries, such as fences, foot-paths, mounds of earth, or side-channels. The transverse section of the surface, when measured, is rarely to be found of a regular convexity. The surface of all the roads, until within a few years, was everywhere cut into deep ruts; and even now, since more attention has been paid to road works, though the surface is smoother, the bed of materials which forms it is universally so thin, that it is weak, and, consequently, exceedingly imperfect. Drainage is neglected; high hedges and trees are allowed to intercept the action of the sun and wind in drying the roads; and many roads, by constantly carrying away the mud from them for a number of years, have been sunk below the level of the adjoining fields, so that they are always wet and damp, and extremely expensive to keep in order, owing to the rapid decay of the materials laid upon them.”

SPEED OF TRAVELLING.

The speed at which a carriage could travel over the bad roads of last century was, as has been hinted, not very great. We may take Shakspeare as representing what was deemed possible in his time, in the words he has put into the mouth of *Portia* in the *Merchant of Venice*:—

I'll tell thee all my whole device
When I am in my coach, which stays
for us
At the park gate; and therefore haste
away,
For we must measure *twenty miles* to-
day.

At a later period better progress was deemed practicable, for the writer of a tract in the *Harleian Miscellany* deprecates the multitude of stage-coaches and carriages now (1673) travelling on the roads, and advises Parliament to interfere to suppress them, “especially those within sixty or seventy miles of London.” He recommends the others being obliged to travel with one set of horses, and to be limited to *thirty miles* in summer, and *twenty-five* in winter *per diem*.

That the obstruction of the roads or rather bridle-tracks—for in many cases they were no better—was not an imaginary evil, though few would agree that the tract-writer had hit upon the proper cure for the difficulty, is shown by an interesting fact recorded in Cleland's valuable book on Glasgow. There we read that “in 1739 Mr. Andrew Thompson, of Glasgow, with a friend, left

Glasgow to ride to London. There was no turnpike road till they came to Grantham, within a hundred and ten miles of the metropolis. Up to that point they travelled on a narrow causeway, with an unmade soft road on each side. As strings of pack-horses met them, from time to time, they were obliged to plunge into the side road, and had often difficulty in scrambling again upon the causeway."

In December 1703, Charles, king of Spain, slept at Petworth on his way from Portsmouth to Windsor, and Prince George of Denmark went to meet him there. "We set out" (as one of the attendants relates) "at six o'clock in the morning to go for Petworth, and did not get out of the coaches (save only when we were overturned or stuck fast in the mire) till we arrived at our journey's end. 'Twas hard service for the Prince to sit fourteen hours in the coach that day, without eating anything, and passing through the worst ways that I ever saw in my life. We were thrown but once indeed in going, but both our coach (which was the leading one) and his Highness's body coach would have suffered very often, if the nimble boors of Sussex had not frequently poised it, or supported it with their shoulders from Godalmin almost to Petworth, and the nearer we approached to the Duke's home the more inaccessible it seemed to be. The last nine miles of the way cost us six hour's time to conquer them,

and indeed we had never done it if our good master had not several times lent us a pair of horses out of his own coach, whereby we were enabled to trace out the way for him. They made us believe that the several grounds we crost and his grace's park would alleviate the fatigue, but I protest I could hardly perceive any difference between them and the common road." This anecdote, taken from the *Annals of Queen Anne*, published in London in 1704, gives a lively picture of travelling under difficulties.

The general badness of the roads in the middle of last century is fully indicated by the novelists of the period; but we must content ourselves with one extract from *Humphrey Clinker*, where it is said, in a letter to Dr. Lewis: "Dear Doctor—Considering the tax we pay for turnpikes, the roads of this country constitute a most intolerable grievance. Between Newark and Wetherby, I have suffered more from jolting and swinging than ever I felt in the whole course of my life, although the carriage is remarkably commodious and well hung, and the postilions were very careful in driving."

The opinion thus indicated is fully borne out by Arthur Young, and, from amidst the generally dry and technical details of his travels, we get a good many glimpses of the state of the roads in England a hundred years ago. Thus, writing of Lancashire in 1770, he

says—"I know not, in the whole range of language, terms sufficiently expressive to describe this infernal road;" and he seriously cautions all travellers who may propose to journey through that "terrible country" to "avoid it as they would the devil, for a thousand to one they break their necks or their limbs by overthrows or breakings down." He tells of ruts four feet deep, filled with mud as the result of a wet summer, and asks, "What therefore must it be after a winter?" The only mending the road gets is described as tumbling in some loose stones, which serve no other purpose than jolting a carriage in the most intolerable manner. Arthur Young adds, "These are not merely opinions, but facts, for I actually passed three carts broken down in those eighteen miles of execrable memory." Of a road near Newcastle, the same writer says, "A more dreadful road cannot be imagined. I was obliged to hire two men at one place, to support my chaise from overturning. Let me persuade all travellers to avoid this terrible country, which must either dislocate their bones with broken pavements, or bury them in muddy sand. It is only bad management that can occasion such very miserable roads in a country so abounding with towns, trade, and manufactures." On another occasion, speaking of the district near Warrington, Young says, "This is a paved road most infamously bad. Any person would imagine the people of the

country had made it with a view to immediate destruction, for the breadth is only sufficient for one carriage, consequently it is at once cut into ruts, and you may easily conceive what a break-down, dislocating road, ruts cut through a pavement must be."

Even on the roads near London, which were confessedly better than those at a distance, any considerable speed in the average rate of travelling was unknown. If it had been otherwise we should not have had the following incident deemed worthy of record in the *Annual Register* (1765), seeing that the speed attained was, after all, under seven miles an hour.

"A few days ago, a mare started from the Fox and Hounds in Tottenham Court Road, to draw a single horse chaise, with a person in it, to Lincoln, in twenty hours, but performed the journey with ease in nineteen hours and a quarter. The distance is upwards of 130 miles." The writings of Pennant give few indications either of how he travelled, or what speed he attained, his attention being given up almost entirely to the topographical and antiquarian affairs of the district through which he journeyed. But here and there are to be found references to his progress, such as the remark in his journey from Chester "after riding from Ingestre, three miles through very bad roads," and other similar allusions.

A commercial traveller who, forty years ago, published *Hints on Commercial Travelling*, has given

us a lively account of the life of the bagman of a hundred years ago, in contrast with the same character in our own day, and the fact that commercial journeys were made on horseback—the roads permitting of almost no other mode of progression—makes the description appropriate to this part of our history:—"The traveller of 1837 and the rider of 1787 are as distinct bipeds as can possibly be classified in the same genus. Their names are not more altered. The old English rider scarcely exists but in tradition. When we have by rare fortune encountered one of those remnants of antiquity, with what reverential curiosity have we noted the time-honoured relic. Not the most enthusiastic geologist could have gazed with more intense interest upon the exhumed bones of a mammoth or any other antediluvian monster. How have we pondered with upraised hands upon his historical records of the olden times—when without the modern paraphernalia of gigs and mackintoshes, but mounted on his stout and sleek palfrey—almost enveloped by saddle-boots of giant mould, he would issue forth upon an excursion of peril and adventure, cheered on his pilgrimage by the beacon of profit!

"These were the high and palmy days of travel. No modern innovations of hurry and despatch clouded the calm dignity of the gentle trot. No goading fears of rivals and competition haunted him, to mar the mild method of

the march. Conscious of bringing his own welcome with him; feeling that his exits and his entrances were marked as *events* by his customers in each town, village, and hamlet; what a pleasing sense of his own worth and dignity must have cheered his lonely ride! . . . See him arrived at his hostelry; with what cares does the rosy-faced host help to extricate him from his pyramid of saddle; with what ready zeal does the dame produce the rasher and the tankard! While these condiments recruit his strength the landlord spreads the glad tidings of his advent, and ere the snowy cloth has disappeared, his customers throng into the little parlour with their hoarded money and the already transcribed order. . . . The morrow brings the facsimile of to-day—another stage, more gin and pipes. . . . Happy forefathers of the road! little did you dream that a few years later would see an end to these patriarchal wanderings. Still less would you foresee the day when severe labour of body and mind, unceasing effort, much tact and more importunity, would be necessary for those who follow in your migrations. . . . In the present time they have ceased to be the confidants of the family secrets of each customer, possibly because their rapid progress through the country leaves too little time to elicit them. The modern bagman has ceased to be the 'Sir Oracle' of the country shopkeeper. In short, we think we need not attempt to prove what

probably no one will take the trouble to dispute, viz. that the traveller of to-day is 'no more like his father' of half a century ago, than is 'Hyperion to a Satyr.'

A witty Dean of St. Paul's, in telling of the differences he experienced, "ætat. 73," through modern improvements, notices amongst other things the change in the roads within London, and says—"I paid £15 in a single year for repairs of carriage springs on the pavement of London; and I now glide without noise or fracture on wooden pavements."

This improvement was not, however, uniform or universal, as may be gathered from the personal experiences of Thomas de Quincey, who, in his *Autobiographic Sketches*, writes—

"That night we went on to Newark, at which place about forty miles of our journey remained. This distance we performed, of course, in the following day, between breakfast and dinner. But it serves strikingly to illustrate the state of the roads in England, whenever your affairs led you into districts a little retired from the capital routes of the public travelling, that, for one twenty-mile stage—viz. from Newark to Sleaford—they refused to take us forward with less than four horses. This was neither a fraud, as our eyes soon convinced us (for even four horses could scarcely extricate the chase from the deep sloughs which occasionally seamed the road through

tracts of two or three miles in succession), nor was it an accident of the weather. In all seasons the same demand was made, as my female protectress found in conducting me back at a fine season of the year, and had always found in traversing the same route. The England of that date (1794) presented many similar cases. At present (1833) I know of but one stage in all England where a traveller, without regard to weight, is called upon to take four horses; and that is at Ambleside, in going by the direct road to Carlisle. The first stage to Patterdale lies over the mountain of Kirkstone, and the ascent is not only toilsome (continuing for above three miles, with occasional intermissions), but at times is carried over summits too steep for a road by all rules of engineering, and yet too little frequented to offer any means of repaying the cost of smoothing the difficulties." In another part of the same paper, De Quincey describes the postilion of his youthful memory as employed "not by fits and starts, but always and eternally, in *quartering*—i.e. crossing from side to side according to the casualties of the ground," the word *quartering* being, as he indicates in another essay, derived from the French *cartayer*, to manœuvre so as to avoid the ruts. In another place he says—"Even in the nineteenth century I have known a case, in the sequestered district of Egremont in Cumberland, where a post-chaise of the

common narrow dimensions was obliged to retrace its route of fourteen miles on coming to a bridge built in some remote age, when as yet post-chaises were neither known nor anticipated, and, unfortunately, too narrow by three or four inches."

ROADS IN SCOTLAND.

We have hitherto spoken of the roads in England, but a reference to the state of the roads in Scotland and Ireland may not be less interesting. With regard to Scotland there would not appear to be much room for difference of opinion yet, as we shall see, a writer of two centuries ago speaks of the roads in Scotland as "tolerably good." The value of such an opinion depends greatly on the point of view and the use to which the writer proposes to put the roads. For wheeled vehicles the roads in Scotland were doubtless as ill-fitted as those in England, while for the use of troops and artillery, as we shall see, they were found utterly insufficient. As to the condition of the roads even in the better-settled parts of Scotland, it is recorded that in 1678 the difficulties in the way of rapid communication were such, that an agreement was made to run a coach between Edinburgh and Glasgow, a distance of 44 miles, which was to be drawn by six horses, and to perform the journey to Glasgow and back in six days! The undertaking was so arduous that the

contractor was to get 200 merks a year for five years (a merk Scots is 1s. 1½d. sterling) to assist him, but the undertaking proved so unprofitable that it had soon to be abandoned. This is within a year of the time when the following description was given in Kirke's *Modern Account of Scotland*:—

"The highways in Scotland are tolerably good, which is the greatest comfort a traveller meets with among them. They have not inns, but change-houses (as they call them), poor small cottages, where you must be content to take what you find, perhaps eggs with chucks in them, and some lang-cale; and at the better sort of them a dish of chop'd chickens, which they esteem a dainty dish, and will take it unkindly if you do not eat very heartily of it, though for the most part you may make a meal with the sight of the fare, and be satisfied with the steam only, like the inhabitants of the world in the moon. Your horses must be sent to a stabler's (for the change-houses have no lodging for them), where they may feed voluptuously on straw only, for grass is not to be had, and hay is so much a stranger to them that they are scarce familiar with the name of it.

"The Scotch gentry commonly travel from one friend's house to another, so seldom make use of a change-house; their way is to hire a horse and a man for two-pence a mile; they ride on the horse thirty or forty miles a day, and the man, who is his guide,

foots it beside him, and carries his luggage to boot.

"The best sort keep only a horse or two for themselves and their best friend; all the rest of the train foot it beside them. To conclude, the whole bulk and selvedge of this countrey is all wonder too great for me to unriddle; there I shall leave it, as I found it, with its agreeable inhabitants in

A land where one may pray with curst intent

Oh, may they never suffer banishment!"

Many and potent as are the evils of war, and especially of civil war, some benefit has accrued to Scotland through the incidents of the '15, by the construction of roads, one result of that rising being that in the Highlands of Scotland many miles of roads have been made at the public expense. "During the rebellion of 1715," says MacCulloch, "the royal troops were unable, from the want of roads and the impracticable nature of the country, to advance beyond Blair in Athole; and to obviate this inconvenience in future, Government soon after began to employ part of the troops quartered in Scotland in the construction of military roads in different parts of the Highlands, which, when finished, extended in all to about 800 miles. Unluckily they were not well planned; being for the most part carried, wherever it was practicable, directly from place to place, they were necessarily hilly, and they were also too narrow. About the commencement of the

present century it became a question whether it was worth while for Government to continue to defray the expense of keeping these roads in repair. But though it was ascertained that they were no longer of any material use as military roads, they were found to be of the greatest importance as affording a means of communication; and the inquiries then set on foot impressed Government with a conviction that nothing would contribute so much to the improvement of the Highlands as their intersection with good roads. But this being an undertaking that exceeded the limited means of the proprietors and inhabitants, parliamentary commissioners were appointed who were authorised to decide upon the roads proper to be constructed, and to superintend their construction; the public agreeing to defray half the cost of such roads, the other half being defrayed by the proprietors or other persons benefited thereby. The measure has been most successful."

These military roads, constructed between 1726 and 1737, of which a part still continue to be kept up, are those referred to in the noted inscription in Fort-William churchyard:—

Had you seen these roads before they
were made,
You would lift up your hands and bless
General Wade.

Why should ignorant people sneer at this epitaph, as if it were something supremely absurd? The phrase "a made road" is

quite well understood in Scotland, and the difference between the tracks formerly existing and the roads thus "made" was something travellers had to be thankful for.

The Parliamentary roads referred to, which were designed by Telford, and are an excellent memorial of his skill as an engineer, were in all about 900 miles in length. The fact that there were 1117 bridges of all sorts and sizes built in the construction of these roads perhaps fully entitles Telford to the designation of *pontifex maximus*, so far as Scotland is concerned. Besides those roads, many others were constructed throughout the Highlands by the local proprietors, notably in Sutherlandshire, which, though even yet not fully opened up, had 350 miles of road made by the Duke of Sutherland, or under his example and influence. The fact that the northern part of the country was too poor to make its own roads at the beginning of the century, will not fail to be remarked as offering a striking contrast to the efforts begun fifty years afterwards to make railways through the district. The general results of road-making in Scotland are admirably summarised by Dr. Robert Carruthers, in referring to Dr. Johnson's departure from Inverness:—"We were now," says Dr. Johnson, "to bid farewell to the luxury of travelling, and to enter upon a country upon which perhaps no wheel has ever rolled," and Dr. Carruthers remarks in his edition of Boswell's *Tour*, "Things

are now changed. The Highland roads, under charge of a parliamentary commission, are perhaps the finest in the kingdom, and are yearly travelled by hundreds of tourists. The military roads were constructed between 1726 and 1737. About five hundred soldiers, under charge of non-commissioned officers, were employed during the summer in the formation of these roads, extra pay being given to them for their labour. The undertaking had been forced upon the Government by the state of the Highlands in 1715, as at that time the royal army could not penetrate farther into the Highlands than Blair-Athole. The old roads were merely the tracks of cattle and horses, intersected by numerous rapid streams, which, being frequently swollen into torrents by heavy rains, rendered them impassable. The military roads were afterwards found insufficient for the purposes of civil life. They were laid out with other views than commerce and industry, and were often dangerously steep and inconvenient. The road by which Johnson travelled to Fort-Augustus is partly one of this description; but the fatigue is compensated by the view of the Fall of Foyers, and by miles of beautiful birch trees, which shade the waters of Loch Ness, and clothe the sides of the neighbouring mountains. A more convenient road to Fort-Augustus and the West Highlands has been made on the opposite bank of Loch Ness. In 1802 Parliament passed an Act,

granting £20,000 towards making roads and building bridges in the Highlands, and for enabling the proprietors to charge their estates with a proportion of the expense of maintaining the different lines of communication. Subsequent grants were made for the same purpose; and by 1820 no less than 875 miles of road were made, at a cost to Parliament of £267,000, to the counties of £214,000, and to individual proprietors of estates of £60,000. The whole of these lines are now under one management, and are kept up at an expense of about £10,000 a year, of which one-half is paid by Government. These improvements, contemporaneous with sheep husbandry and the better cultivation of the soil, have vastly increased the value of Highland estates. As an example of this we may cite the estate of Glengarry, a wild, romantic, and once almost inaccessible country, in which feudal manners long remained. This property, in 1788, did not yield more than £800 per annum; and in fifty years afterwards the rental was £7000."

M'Culloch speaks to the like effect as regards the improvement of the roads, in the second volume of his *British Empire* :—

"In 1750 the roads of Scotland were in the most wretched state imaginable, being, in fact, in most places mere horse-paths, and these practicable only at certain seasons of the year. After the country began to improve, and wealth to increase, the necessity of adopting

some more efficient system for the repair of the roads became obvious. In consequence, Acts of Parliament were obtained, authorising the formation of the turnpike roads, and regulating the amount of toll to be charged on those using them. . . It is not easy indeed for those unacquainted with the country to imagine the extraordinary improvement that has been effected in the roads of Scotland within the last half century. Many of them have been planned with great skill, and notwithstanding the comparatively rugged uneven surface of the country, they are for the most part more level than the English roads. It is not going too far to say that, from being about the very worst, the roads in Scotland have become about the very best of any in the world."

Against this general testimony as to the condition of the roads in Scotland, we are tempted to quote the impression made upon one distinguished traveller by a particular road in Scotland. Writing in 1842, Her Majesty the Queen tells us (*Leaves from the Journal of our Life in the Highlands*) that the last part of the road between Bridge of Earn and Perth was "very bad travelling, up and down hill." It was the Queen's first experience of a country she has since come to cherish so warmly, and doubtless the ruggedness of the travelling she has since undergone in the Highlands has long since obliterated the unfavourable impres-

sion of what is, though doubtless "up and down hill," yet a very fair specimen of our secondary roads.

Ireland would not be Ireland if it did not stand differently as regards its roads from the other parts of the empire. "A history of public works in Ireland," it has been drily said by Arthur Young, "would be a history of jobs." In 1763, "statute labour" was abolished in Ireland, and roads were thereafter made by order of the grand juries, or the Postmaster-General—the finessing and even uglier methods of securing a "presentment" for the making of a new road being a fruitful theme for all Irish novelists. The usual benefits to the public, as respects facility of conveyance, have followed the development of roads in Ireland, but there is not the satisfaction of looking upon them as the result of the public spirit or the enterprise of those who have most directly benefited by them. For the purposes of this book it may be sufficient to quote M'Culloch's opinion that the roads in Ireland, at the time he wrote, were, "generally speaking well laid out, and in a good state of repair."

THE PLEASURES AND DANGERS OF COACH TRAVELLING.

Dr. Johnson, though wedded to London life and London streets, has left on record one or two testimonies to the pleasure of

travelling in a post-chaise—in his day the most rapid and luxurious mode of travel in existence.

The system of travelling "post," it may be here noticed, was introduced in 1734 by Mr. John Tull, an artillery officer, son of Jethro Tull, the well-known writer on husbandry, and who obtained a patent for employing post-chaises in travelling. The plan was successful; but the ingenious inventor got so little benefit by it that he died in the King's Bench thirty years afterwards. To return to Dr. Johnson, there might be some ingenuity displayed in conjecturing what the gruff Sybarite would have said had he lived in the days of express trains, "Pullman palace cars," and gigantic railway hotels. Speed in travelling was one of the elements of pleasure on which he dwelt; yet it was only one of the sources from which he believed the gratifications of travelling were to be derived.

"In our way," says his faithful biographer, "Johnson strongly expressed his love of driving fast in a post-chaise. 'If,' said he, 'I had no duties and no reference to futurity, I would spend my life in driving briskly in a post-chaise with a pretty woman; but she should be one who could understand me, and would add something to the conversation.'" And yet this was the man who thought the glories of the country "not equal to Fleet Street!"

Johnson showed that good company (whether that of a "pretty



POST-CHAISE.

woman" or one of the rougher sex) was of more account, however, than speed. Thus, upon another occasion, and in a very different part of the country, he writes :—"We travelled on with the gentle pace of a Scotch driver, who, having no rivals in expedition, neither gave himself nor his horses unnecessary trouble. We did not affect the impatience we did not feel, but were satisfied with the company of each other, as well riding in the chaise as sitting at an inn."

In Boswell's story of the same tour, we find the Rambler expressing again his love of society as an element of pleasure in travelling :—"It is very disagreeable riding in Skye. The way is so narrow, one only at a time can travel, so it is quite unsocial; and you cannot indulge in meditation by yourself, because you must be always attending to the steps which your horse takes." When riding had first to be adopted in the tour, the following was Dr. Johnson's view of the case, as expressed in his own *Journey to the Western Islands* ;—

"We were now (30th August) to bid farewell to the luxury of travelling, and to enter upon a country upon which perhaps no wheel has ever rolled. We could indeed have used our post-chaise one day longer, along the military road to Fort-Augustus, but we could have hired no horses beyond Inverness." On reaching Mull, quite an unexpected sensation of pleasure filled the hearts of the

travellers, and from a very simple cause. Boswell writes thus :—

"As we walked up from the shore, Dr. Johnson's heart was cheered with the sight of a road marked with cart-wheels, as on the mainland, a thing which we had not seen for a long time. It gave us a pleasure similar to that which a traveller feels when, whilst wandering on what he fears is a desert island, he perceives the print of human feet."

On another occasion, travelling between Chapel House and Stratford-on-Avon, Boswell records a somewhat similar remark :—

"In the afternoon, as we were driven rapidly along in the post-chaise, he said to me, "Life has not many things better than this."

We are not sure that it can be claimed as another contemporary instance of the pleasures of riding in a coach that, as recorded by Smollett in his *Continuation*, Earl Ferrers requested permission to drive to the place of execution at Tyburn in his own landau. He appeared gaily dressed in a light-coloured suit of clothes, embroidered with silver, and was attended in the landau by one of the sheriffs. The earl was executed in 1760.

It was in the course of his last-mentioned journey that Johnson expressed to Boswell his great delight with the pleasures of inn-life, which may be quoted here, as the expressions were used in connection with private and not with public travelling :—

"We dined at an excellent inn

at Chapel House, where he expatiated on the felicity of England in its taverns and inns, and triumphed over the French for not having, in any perfection, the tavern life. "There is no private house," said he, "in which people can enjoy themselves so well as at a capital tavern. Let there be ever so great plenty of good things, ever so much grandeur, ever so much elegance, ever so much desire that everybody should be easy, in the nature of things it cannot be; there must always be some degree of care and anxiety. The master of the house is anxious to entertain his guests—the guests are anxious to be agreeable to him; and no man, but a very impudent dog indeed, can as freely command what is in another man's house, as if it were his own. Whereas, at a tavern, there is a general freedom from anxiety. You are sure you are welcome; and the more noise you make, the more trouble you give, the more good things you call for, the welcomer you are. No servants will attend you with the alacrity which waiters do, who are incited by the prospect of an immediate reward in proportion as they please. No, sir, there is nothing which has yet been contrived by man, by which so much happiness is produced, as by a good tavern or inn."

Many modern writers, just before the railway system was introduced, dwelt fondly upon the pleasures of coach travelling, and we give extracts, in which the

gratification derived from speed, one of Dr. Johnson's happiest ideas in regard to coach travelling, is also expressed.

"Shall we (asks a writer in *Blackwood* of 1826) journey in a barouche? pleasantest of land-carriages, whether horsed with chesnuts or bays. Tree and tower go swimmingly by, and whole fields of corn-sheaves seem of themselves to be hurrying to harvest home. The whole world is a peristrepthic panorama, and turnpike-gates seem placed not to impede motion, but to promote it. Village follows village quickly, even in a thinly inhabited country, so rapid is the imperceptible progress of the sixteen hoofs; and we drive through towns and cities from sun to sun."

Leigh Hunt, in one of his pleasant essays, has spoken of the same subject, contrasting the relative merits of the carriage, the post-chaise, and the hackney coach, and, like those whose opinions we have already quoted, giving the preference to the chaise:—

"The carriage, as it is indifferently called (as if nothing less genteel could carry any one), is a more decided thing than the chaise; it may be swifter than the mail, leaves the stage at a still greater distance in every respect, and (forgetting what it may come to itself) darts by the poor old lumbering hackney with immeasurable contempt. It rolls with a prouder ease than any other vehicle. It is full of cushions and comfort, elegantly coloured



inside and out ; rich, yet neat ; light and rapid, yet substantial. The horses seem proud to draw it. The fat and fair wigged coachman 'lends his sounding lash,' his arm only in action, and that little, his body well set with its own weight. The footman in the pride of his nonchalance, holding by the straps behind, and glancing down sideways between his cocked hat and neckcloth, stands swinging from east to west upon his springy toes. The horses rush along amidst their glancing harness. Spotted dogs leap about them, barking with a princely superfluity of noise. The hammercloth trembles through all its fringe. The paint flashes in the sun. We, contemptuous of everything less convenient, bow backwards and forwards with a certain indifferent

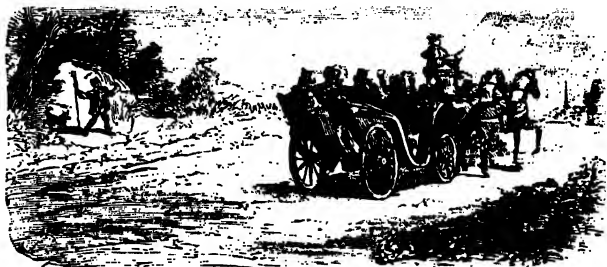
air of gentility infinitely predominant. Suddenly, with a happy mixture of turbulence and truth, the carriage dashes up to the curbstone to the very point desired, and stops with a lordly wilfulness of decision. The coachman looks as if nothing had happened. The footman is down in an instant ; the knocker reverberates into the furthest corner of the house ; doors, both carriage and house, are open. We descend, casting a matter-of-fact eye at the bystanders ; and the moment we touch the pavement, the vehicle, as if conscious of what it carried, and relieved from the weight of our importance, recovers from its sidelong inclination with a jerk, tossing and panting as it were for very breath, like the proud heads of the horses. All this it must be owned is very

pretty, but it is also gouty and superfluous. It is too convenient, too exacting, too exclusive. We must get too much for it and lose too much by it. Its plenty, as Ovid says, makes us poor."

In contrast to this graphic picture of the sumptuous private

carriage, Leigh Hunt paints the pleasures of the post-chaise. "A post-chaise," he says, "in the company of those we love, is home in motion." And he goes on to depict the peculiar delight of rapid progress, as others have done:—

"The smooth running along



the road, the fresh air, the variety of scene, the leafy roads, the bursting prospects, the clatter through a town, the gaping gaze of a village, the hearty appetite (your chaise waiting only upon your own movements), even the little contradictions to home comfort and the expedients upon which they set us, all put the animal spirits at work, and throw a novelty over the road of life. If anything could grind us young again, it would be the wheels of a post-chaise."

The ostentatious vulgar-rich use of a carriage is admirably described by the genial American writer, Washington Irving:—"A wealthy citizen, who had amassed a vast fortune; and having purchased the estate and mansion of a ruined nobleman in the neighbourhood,

was endeavouring to assume all the style and dignity of an hereditary lord of the soil. The family always came to church *en prince*. They were rolled majestically along in a carriage emblazoned with arms. The crest glittered in silver radiance from every part of the harness where a crest could possibly be placed. A fat coachman, in a three-cornered hat, richly laced, and a flaxen wig, curling close round his rosy face, was seated on the box, with a sleek Danish dog beside him. Two footmen, in gorgeous liveries, with huge bouquets, and gold-headed canes, lolled behind. The carriage rose and sunk on its long springs with peculiar stateliness of motion. The very horses champed their bits, arched their necks, and glanced their eyes

more proudly than common horses; either because they had caught a little of the family feeling, or were reined up more tightly than ordinary.

"I could not but admire the style with which this splendid pageant was brought up to the gate of the churchyard. There was a vast effect produced at the turning of an angle of the wall;—a great smacking of the whip, straining and scrambling of horses, glistening of harness, and flashing of wheels through gravel. This was the moment of triumph and vainglory to the coachman. The horses were urged and checked until they were fretted into a foam. They threw out their feet in a prancing trot, dashing about pebbles at every step. The crowd of villagers, sauntering quietly to church, opened precipitately to the right and left, gaping in vacant admiration. On reaching the gate, the horses were pulled up with a suddenness that produced an immediate stop, and almost threw them on their haunches.

"There was an extraordinary hurry of the footmen to alight, pull down the steps, and prepare everything for the descent on earth of this august family. The old citizen first emerged his round red face from out the door, looking about him with the pompous air of a man accustomed to rule on 'Change, and shake the Stock Market with a nod. His consort, a fine, fleshy, comfortable dame, followed him. There seemed, I must confess, but little pride in

her composition. She was the picture of broad, honest, vulgar enjoyment. The world went well with her; and she liked the world. She had fine clothes, a fine house, a fine carriage, fine children, everything was fine about her: it was nothing but driving about, and visiting and feasting. Life was to her a perpetual revel; it was one long Lord Mayor's day."

Leigh Hunt's reference to the bystanders in one case, and the "gaping gaze" of a village, referred to by him and Washington Irving, seem to suggest the question whether there may not be a reflection of the pleasures so delightfully described in the feelings of the spectators. If the pleasures of post-chaise travelling are things of the past so far as the traveller is concerned, may there not be in some respects a loss of pleasure, even may we not say of education, in the withdrawal from our road-side villages of the sights that enlivened the road, and the effect which the coming and going of the coaches must have had in opening the eyes of the young to the existence of other worlds than their own quiet and secluded home? If we ask whether or not some of the pleasures of carriage people might not be conveyed also to the spectator, even though it only took the shape of seeing the end of the journey, Lord Cockburn would seem to have answered this question so far in the affirmative, in recording an incident which may, in another point of view,

suggest that people may have lost something in the cultivation of grace and dignity, through the decrease in the importance of coaches in the daily life of the world. Lord Cockburn thus refers to a famous beauty of his time :— “Mrs. Rothead’s descent from her carriage, where she sat like a nautilus in its shell, was a display which no one in these days could accomplish or even fancy. The mulberry-coloured coach, spacious, but apparently not too large for what it carried—though she alone was in it; the handsome jolly coachman and his splendid hammercloth loaded with lace; the two respectful liveried footmen, one on each side of the richly carpeted step; these were lost sight of amidst the slow majesty with which the lady came down, and touched the earth.”

The slowness of travelling last century brought into play a virtue pleasing in itself, but, perhaps, at times burdensome to those who come under its operation—namely, hospitality. Dr. Carruthers, speaking of Johnson’s and Boswell’s Tour, puts what we refer to in a felicitous way. He says :—“Travelling from one end of a Highland parish to another was then a serious business. It was not merely that the roads were bad, but there were so many old families by the way whom you could not pass by without calling upon, that, what with a late sitting at one place, and a dance at another, a journey that is now performed in one day usually took a week or more.”

While coach travelling had thus its disagreeables in the shape of bad roads, and its pleasures where the roads were a little more favourable, it had its dangers of accident and robbery, which give a reverse side to the picture on which we have just dwelt. It was an accident to a “hired coach and four” which served to introduce Humphrey Clinker to the world, and the graphic picture given of the incident by Smollett may serve as an illustration of the mishaps and difficulties of a traveller in last century :—

“I proceed to give you an account of our journey to London, which has not been wholly barren of adventure. Tuesday last, the squire took his place in a hired coach and four, accompanied by his sister and mine and Mrs. Tabby’s maid, Winifred Jenkins, whose province it was to support Chowder on a cushion in her lap. I could scarce refrain from laughing when I looked into the vehicle, and saw that animal sitting opposite to my uncle like any other passenger. The squire, ashamed of his situation, blushed to the eyes; and, calling to the postillions to drive on, pulled the glass up in my face. I, and his servant John Thomas, attended him on horseback.

“Nothing worth mentioning occurred till we arrived on the edge of Marlborough Downs. There one of the fore-horses fell, in going down hill at a round trot; and the postillion behind, endeavouring to stop the carriage,

pulled it on one side into a deep rut, where it was fairly overturned. I had rode on about two hundred yards before, but, hearing a loud scream, galloped back and dismounted, to give what assistance was in my power. When I looked into the coach, I could see nothing distinctly but the nether end of Jenkins, who was kicking her heels and squalling with great vociferation. All of a sudden my uncle thrusts up his bare pate, and bolted through the window, as nimble as a grasshopper, having made use of poor Win as a step to rise in his ascent. The man, who had likewise quitted his horse, dragged this forlorn damsel, more dead than alive, through the same opening. Then Mr. Bramble, pulling the door off its hinges with a jerk, laid hold on Liddy's arm, and brought her to the light very much frightened, but little hurt. It fell to my share to deliver our aunt Tabitha, who had lost her cap in the struggle, and, being rather more than half frantic with rage and terror, was no bad representation of one of the sister furies that guard the gates of hell. She expressed no sort of concern for her brother, who ran about in the cold without his periwig, and worked with the most astonishing agility in helping to disentangle the horses from the carriage. But she cried, in a tone of distraction, 'Chowder! Chowder! my dear Chowder; my poor Chowder is certainly killed!'

"This was not the case—Chowder,

after having tore my uncle's leg in the confusion of the fall, had retreated under the seat, and from thence the footman drew him by the neck; for which good office he bit his fingers to the bone. The fellow, who is naturally surly, was so provoked at this assault, that he saluted his ribs with a hearty kick. . . .

"The coach being adjusted, another difficulty occurred—Mrs. Tabitha absolutely refused to enter it again, unless another driver could be found to take the place of the postillion; who, she affirmed, had overturned the carriage from malice aforethought. After much dispute, the man resigned his place to a shabby country fellow, who undertook to go as far as Marlborough, where they could be better provided; and at that place we arrived about one o'clock, without further impediment. Mrs. Bramble, however, found new matter of offence, which indeed she had a particular genius for extracting at will from almost every incident in life. We had scarce entered the room at Marlborough, where we stayed to dine, when she exhibited a formal complaint against the poor fellow who had superseded the postillion. She said he was such a beggarly rascal that he had ne'er a shirt to his back. . . .

"'This is a heinous offence, indeed,' cried my uncle; 'let us hear what the fellow has to say in his own vindication.' He was accordingly summoned, and made his appearance, which was equally

queer and pathetic. He seemed to be about twenty years of age, of a middling size, with bandy legs, stooping shoulders, high forehead, sandy locks, pinking eyes, flat nose, and long chin ; but his complexion was of a sickly yellow. His looks denoted famine ; and the rags that he wore could hardly conceal what decency requires to be covered. My uncle, having surveyed him attentively, said, with an ironical expression in his countenance, 'An't you ashamed, fellow, to ride postillion without a shirt to cover you from the view of the ladies in the coach ?' 'Yes, I am, an' please your noble honour,' answered the man ; 'but necessity has no law, as the saying is—And more than that, it was an accident—My breeches cracked behind, after I got into the saddle'—'You're an impudent varlet,' cried Mrs. Tabby, 'for presuming to ride before persons of fashion without a shirt.'—'I am so, an' please your worthy ladyship,' said he ; 'but I am a poor Wiltshire lad. I ha'n't a shirt in the world, that I can call my own, nor a rag of clothes, an' please your ladyship, but what you see—I have no friend or relation upon earth to help me out—I have had the fever and ague these six months, and spent all I had in the world upon doctors, and to keep soul and body together ; and, saving your ladyship's good presence, I ha'n't broke bread these four-and-twenty hours'—

"Mrs. Bramble, turning from him, said she had never seen such

a filthy tatterdemalion, and bid him begone, observing that he would fill the room full of vermin. Her brother darted a significant glance at her, as she retired with Liddy into another apartment ; and then asked the man if he was known to any person in Marlborough. When he answered that the landlord of the inn had known him from his infancy, mine host was immediately called, and, being interrogated on the subject, declared that the young fellow's name was Humphrey Clinker ; that he had been brought up in the workhouse, and put out apprentice by the parish to a country blacksmith, who died before the boy's time was out ; that he had for some time worked under his ostler, as a helper and extra postillion, till he was taken ill of the ague, which disabled him from getting his bread ; that, having sold or pawned everything he had in the world for his cure and subsistence, he became so miserable and shabby that he disgraced the stable, and was dismissed ; but that he never heard anything to the prejudice of his character in other respects. 'So that the fellow being sick and destitute,' said my uncle, 'you turned him out to die in the streets ?' 'I pay the poor's rate,' replied the other, 'and I have no right to maintain idle vagrants, either in sickness or health ; besides, such a miserable object would have brought a discredit upon my house'—

"'You perceive,' said the squire, turning to me, 'our landlord is a

Christian of bowels. Who shall presume to censure the morals of the age, when the very publicans exhibit such examples of humanity? Hark ye, Clinker, you are a most notorious offender. You stand convicted of sickness, hunger, wretchedness, and want. But, as it does not belong to me to punish criminals, I will only take upon me the task of giving you a word of advice—Get a shirt with all convenient despatch, that your nakedness may not henceforward give offence to travelling gentlewomen, especially maidens in years.'

"So saying, he put a guinea into the hand of the poor fellow, who stood staring at him in silence."

In another letter, Smollett refers to the overturning of a coach, which was evidently of frequent occurrence:—

"About five days ago we arrived in London, after an easy journey from Bath; during which, however, we were overturned, and met with some other little incidents which had like to have occasioned a misunderstanding betwixt my uncle and aunt; but now, thank God, they are happily reconciled."

Captain Birt thus depicts the terrors of travelling in Scotland early in last century:—"The inhabitants of the low Country of Scotland have ever dreaded the Difficulties and Dangers of Travelling among the Mountains; and when some extraordinary Occasion has obliged any one of them to make such a Progress, he has,

generally speaking, made his Testament before he set out, as though he were entering upon a long and dangerous Sea Voyage, wherein it was very doubtful if he should ever return."

The chief thing, however, that gave danger and zest to coach travelling last century was the risk of robbery, of which the literature of the period is only too full. Such an incident as the following, where the carelessness of the owner of valuable property led very naturally to its being stolen, is paralleled in our own day, when the jewels of a noble lady unaccountably disappeared from a railway station because the attention of those entrusted with their charge was momentarily diverted:—

"On Tuesday last a lady, through forgetfulness, left a box of jewels in the front pocket of a post-chaise, at Portsmouth, and before she recollected her negligence, they were gone beyond the probability of recovery." But the *Annual Register* for 1766, from which this is taken, gives a better illustration of the dangers of post-chaise travelling in the same year, in the near vicinity of London. In this case we learn that while investigating a robbery committed by soldiers of the light horse, their Major took a Justice's clerk in a post-chaise to Hounslow to give directions to apprehend two of them; but on the road near Brentford, they were stopped by other two of the robbers, one of whom put a horse-pistol into the

chaise, but it exploded without doing any injury ; upon this the Major fired a pistol from the chaise and wounded one of the soldiers in the cheek, and the persons in the chaise jumped out and took both of them.

All highway robberies were not prosaic, however ; and in illustration of this remark two stories may be quoted, drawn from different periods.

“ Riding out with some of his confederates, Claude du Val overtook a coach, which they had set overnight, having intelligence of a booty of £400 in it. In the coach was a knight, his lady, and only one serving-maid, who, perceiving five horsemen making up to them, presently imagined they were beset ; and they were confirmed in this apprehension by seeing them whisper to one another, and ride backwards and forwards. The lady, to show she was not afraid, takes a flageolet out of her pocket, and plays ; Du Val takes the hint, plays also, and excellently well, upon a flageolet of his own ; and in this posture he rides up to the coach side. ‘ Sir,’ says he to the person in the coach, ‘ your lady plays excellently, and I doubt not but that she dances as well ; will you please to walk out of the coach, and let me have the honour to dance one currant with her upon the heath ? ’ ‘ Sir,’ said the person in the coach, ‘ I dare not deny anything to one of your quality and good mind ; you seem a gentleman, and your request is

very reasonable ;’ which said, the lacquey opens the boot, out comes the knight, Du Val leaps lightly off his horse, and hands the lady out of the coach. They danced, and here it was that Du Val performed marvels ; the best master in London, except those that are French, not being able to show such footing as he did in his great riding French boots. The dancing being over, he waits on the lady to her coach. As the knight was going in, says Du Val to him, ‘ Sir, you have forgot to pay the music.’ ‘ No, I have not,’ replied the knight, and putting his hand under the seat of the coach, pulls out a hundred pounds in a bag, and delivers it to him ; which Du Val took with a very good grace, and courteously answered, ‘ Sir, you are liberal, and shall have no cause to repent your being so ; this liberality of yours shall excuse you the other £300,’ and, giving him the word, that if he met with any more of the crew, he might pass undisturbed, he civilly takes his leave of him.” Claude Du Val, of whom Leigh Hunt records the above story in his *Thieves Ancient and Modern*, was the gentleman highwayman, who had so endeared himself to his victims that when he was executed at Tyburn “ showers of tears from fair eyes bedewed his fate.” According to Butler, he taught people

“ How to hang in a more graceful
fashion,
Than e’er was known before to the dull
English nation ! ”

The other story is of a hundred years ago, and speaks of a trick for deceiving highwaymen which, though dangerous, was sometimes practised. "Lady Browne and I," says Horace Walpole, "were as usual going to the Duchess of Montrose (at Twickenham Park) at seven o'clock. The evening was very dark. In the close lane near her park-pale, and within twenty yards of the gate, a black figure on horseback pushed by between the chaise and the hedge on my side. I suspected it was a highwayman, and so I found did Lady Browne, for she was speaking and stopped. . . I heard a voice cry 'Stop!' and the figure came back to the chaise. I had the presence of mind before pulling down the glass to take out my watch and stuff it within my waistcoat under my arm. He said, 'Your purses and watches.' I replied, 'I have no watch.' 'Then your purse.' I gave it to him; it had nine guineas. It was so dark that I could not see his hand, but felt him take it. He then asked for Lady Browne's purse, and said, 'Don't be frightened; I will not hurt you.' I said, 'No, you won't frighten the lady.' He replied; 'No; I give you my word I will do you no hurt.' Lady Browne gave him her purse, and was going to add her watch, but he said, 'I am much obliged to you! I wish you good night!'" pulled off his hat, and rode away. 'Well,' said I, 'Lady Browne, you will not be afraid of being robbed another

time, for you see there is nothing in it.' 'Oh, but I am,' said she, 'and now I am in terrors lest he should return, for I have given him a purse with only bad money that I carry on purpose.' 'He certainly will not open it directly,' said I, 'and at the worst he can only wait for us on our return; but I will send my servant back for a horse and a blunderbuss,' which I did." "One dare not stir out after dinner," says Walpole, in another place, "but well armed. If one goes abroad to dinner, you would think one was going to the relief of Gibraltar." And again: "If partridge-shooting is not turned into robber-shooting, there will be an end of all society."

The various characters of thieves, robbers, and highwaymen, seem to have been made the subject of conversation and classification and an intelligent foreigner of a century ago thus records the information he obtained on this subject:—

"The highest order of thieves are the pickpockets or cut-purses, whom you find everywhere, and sometimes even in the best companies. They are generally well and handsomely dressed, so that you take them to be persons of rank; as indeed may sometimes be the case; persons who by extravagance and excesses have reduced themselves to want, and find themselves obliged at last to have recourse to pilfering and thieving.

"Next to them come the high-

waymen, who rob on horseback, and often, they say, even with unloaded pistols they terrify travellers, in order to put themselves in possession of their purses. Among these persons, however, there are instances of true greatness of soul : there are numberless instances of their returning a part of their booty where the party robbed has appeared to be particularly distressed ; and they are seldom guilty of murder.

"Then come the third and lowest, and worst of all thieves and rogues, the footpads before mentioned, who are on foot and often murder in the most inhuman manner, for the sake of only a few shillings, any unfortunate people who happen to fall in their way. Of this several mournful instances may be read almost daily in the English papers. Probably they murder because they cannot, like highwaymen, aided by their horses, make a rapid flight, and therefore such pests are frequently pretty easily pursued and taken, if the person robbed gives information of his robbery in time."

It was not often, probably, that the same person was attacked by both a footpad and a highwayman on the same night and shot both. Such a case did, however, occur, and the story may not unfitly follow Charles Moritz's descriptive catalogue of the marauders who made travel by road so exciting and dangerous :—"On April 14th, 1770, about ten in the evening, two gentlemen in a post-chaise

coming over Blackheath were stopped by a single man dressed in a carter's frock. One of the gentlemen, a military officer, told the fellow in a peremptory manner that he would not be robbed, and desired him to desist, but the villain presenting a pistol, and threatening violence, the gentleman shot him dead on the spot.

"The same gentlemen had not rode above three miles farther on their way to town, when they were attacked again by a highwayman well mounted near the Red House. The gentleman who killed the footpad shot directly through the blind of the chaise, and is supposed to have wounded him, as the horse upon which he rode sprung into a ditch by the road-side, and was afterwards found without his rider on the road adjoining to Kent St. turnpike that leads to Rutherhithe, and a great deal of blood was traced near the ditch where the horse had plunged." The *Annual Register*, whence the story is taken, does not state whether or not it ever was discovered if the second robber was killed.

There is in everything a balance of compensation ; and in view of the dangers of coach travelling we may well allow the following remark of a 'devoted upholder of coaching to have some weight :—

"There was danger in travelling by a coach ; but, after all, nothing to a railway. You get upset in a coach or in a chaise, and there you were. You get upset in a railway, and where are you ?"



CHAPTER III.

—“covered with velvet red,
And cloths of fine gold all about your head,
With damask white and azure blue,
Well-diapered with lilies new ;
Your pomelles shall be ended with gold,
Your chains enamelled many a fold ;
Your mantle of rich degree,
Purple pall, and ermine free ;
Jennets of Spain that be so white,
Trapped to the ground with velvet bright.”

Squyr of Low Degree.

FAMOUS AND SUMPTUOUS COACHES—THE KORFF BERLINE—WASHINGTON'S STATE COACH—ANCIENT AND EXISTING STATE CARRIAGES—THE LORD MAYOR'S COACH—ROYAL STATE CARRIAGES—ORIENTAL STATE CARRIAGES—AN AUTOMATON MODEL CARRIAGE—THE QUEEN'S CORONATION—THE INFERNAL MACHINE—EXISTING SPECIMENS OF GAUDY CARRIAGES—JOHN GILPIN—FANCIFUL COACHES—THE “THREE-WHEELED CHARIOT”—A SIX-WHEELED CARRIAGE—THE CHAR VOLANT—PREVENTION OF ACCIDENTS—THE IRISH NODDY—VARIOUS NATIONAL VEHICLES—THE WAGONETTE—THE PERAMBULATOR.

FAMOUS AND SUMPTUOUS COACHES.

AMONGST coaches, that which has been made most famous historically is the new Berline with which King Louis XVI. and Marie Antoinette made the effort at flight from Paris which ended so disastrously at Varennes. Turning to the pages of Carlyle, the reason why this berline should be deemed so famous will be abundantly evident. But before doing so, it may be useful to learn why the berline or berlin received that name, and what sort of a vehicle it was that gained so

much celebrity on the occasion referred to. The etymology of the word seems not very clear, as a number of different interpretations are to be found. In the French *Encyclopédie* it is described as a kind of carriage which takes its name from the city of Berlin in Germany. Some persons ascribe the invention of it to Italy, and pretend to find the etymology of it in *berlina*, a name given by the Italians to a kind of stage on which criminals are exposed to public ignominy.

Beckmann's version seems to reconcile the Italian and the German origin of the name, when he says—

"Philip de Chiese, a native of Piedmont in the service of Frederick William, elector of Brandenburg, being once sent to France on his master's business, caused to be built on purpose for the journey a carriage capable of containing two persons, which in France and everywhere else was much approved and called a berline." This Philip de Chiese died at Berlin in 1673.

The first derivation of the word is generally adopted by modern authorities, and Webster describes the carriage as "a four-wheeled chariot invented in the seventeenth century at Berlin," and that it had "a carriage body and a hood over the rumble." That it was a common term for a coach in England early in last century may be seen by many references in literature, one of which from Swift's *Answer to a Scandalous Poem* (1733) may suffice for quotation :—

And jealous Juno, ever snarling
Is drawn by peacocks in her berlin,

a picture which may lead us for the moment to class the Berline among fanciful as well as famous coaches. It should be noted that we find the word differently applied in the earlier years of the century, and in such a way as to cast doubts on the derivations quoted. In some of the last Acts passed by the Scottish Parliaments before the Union, there are references to

a kind of ship or boat called a berline. The royal burghs on the west coast of Scotland were in 1705 ordered to maintain two "berlines" to prevent the importation of "victual" from Ireland, this importation being forbidden at the time ; and two years later an Act was passed to pay the expenses of the berlines.

THE KORFF BERLINE.

The berline of the Baroness de Korff was the vehicle in which the unfortunate king and queen of France endeavoured to make their escape, and the arrangements were so cumbrous and injudicious that it would have been a marvel indeed had the royal fugitives not been discovered and eventually captured.

The story is pointedly and graphically told by Carlyle. We can picture distinctly the escape of the hooded dame and the two hooded children, through the Court of Princes, through the Place du Carrousel, and into the Rue de l'Echelle, where the glass-coach that is to carry them to the "new berline" is in waiting. We endure a feeling of painful suspense as the queen herself escapes, and turns into the wrong street, while the "deft active Fersen" chafes at her non-arrival. As midnight approaches, he recovers the strayed lady, and drives off to the Barrière St. Martin, where the Baroness de Korff's berline, with six horses, is drawn up. "The august glass-coach fare, six insides, hastily packs

itself into the new berline," and then comes the clumsy flight, the ponderousness of the coach and its attendant guards attracting notice and arousing suspicion, where quietness and secrecy were of so much moment. Then there is at Bondy another chaise with waiting-women and their band-boxes, "whom also her majesty could not travel without"—the women doubtless who were to be her personal attendants, to put off and on and have the care of the new clothes described by Carlyle in a previous chapter, and regarding which he says, with the caustic humour that runs through all this description—"No queen can stir without new clothes. Therefore, now, Dame Campan whisks assiduous to this mantua-maker and to that; and there is clipping of frocks and gowns, upper clothes and under, great and small; such a clipping and sewing as might have been dispensed with." Into the midsummer night flies the berline with its precious cargo and its crowd of suspicions; but in the meantime a new scene opens up in Paris, where the flight has been discovered, and another famous coach, or rather series of coaches, comes in view. These are the "dull leathern diligences," with the news of the flight of the king, which passed "along all highways: towards the utmost borders; till all France is ruffled—roughened up (metaphorically speaking), into one enormous, desperate-minded, red goggling Turkey Cock!" The heavy new

berline was a tremendous blunder. When the alarm is given, the "scare-crow of an herb-merchant," who has seen the grand new coach in the Forest of Bondy, gives notice, and the pursuers are at once upon the track. At this point Carlyle breaks into an exclamation which is worth quoting, and which may bring to a close our notice of this famous coach:—

"Miserable new Berline! Why could not Royalty go in some old Berline similar to that of other men? Flying for life, one does not stickle about his vehicle. Monsieur, in a commonplace travelling carriage is off northwards, Madame, his Princess, in another, with variation of route, they cross one another while changing horses, without look of recognition, and reach Flanders, no man questioning them. Precisely in the same manner the beautiful Princess de Lamballe sets off, about the same hour; and will reach England safe:—would she had continued there! The beautiful, the good, but the unfortunate; reserved for a frightful end!

"All runs along, unmolested, speedy, except only the new Berline. Huge leathern vehicle:—huge Argosy, let us say, or Acapulco ship; with its heavy stern boat of chaise and pair; with their yellow pilot-boats of mounted bodyguard couriers, rocking aimless round it and ahead of it, to bewilder, not to guide. It lumbers along lurchingly with stress; noted of all the world. . . . Royalty, flying

for life, accomplishes sixty-nine miles in twenty-two incessant hours." So the progress goes, till at Ste. Menehould, "lumbering along, with its mountains of band-

boxes, and chaise behind, the Korff Berline rolls in; huge Acapulco ship with its cock-boat having got thus far." Then the "acrid choleric Drouet," post-



THE "KORFF BERLINE"—RECOGNITION OF LOUIS XVI.

master there, compares the head inside the carriage with the engraving on an assignat, rushes off by cross-roads to Varennes, where under the archway, the road is blocked, the "huge Berline" is relieved of its contents, and a day

or two afterwards rolls back into Paris, with "National-Assembly Commissioner Pétion" (drinking his glass of wine in the royal carriage and "flinging out his chicken bones past the nose of Royalty itself.")

WASHINGTON'S STATE COACH.

As a contrast to this story of a famous royal coach, we may refer to the honour in which the recollection of "Washington's state coach" is held by the Americans—a great yellow state-coach, standing high upon its wheels, and suspended upon straight springs—of which a very excellent representation will be found in vol. xii. of *Scribner's Monthly*. It is in connection with the United States that we have the origin of the phrase "leathern convenience," which is often encountered in reading of sedan chairs and coaches. The incident is thus narrated by a writer in the magazine named above:—

"Mrs. Robert Murray (who entertained Lord Howe and the British officers while Putnam the rebel general was quietly escaping with his division) was a Miss Lindley, and her eldest son was Lindley Murray, the noted grammarian. Having injured his spine in early life by a gymnastic feat, it was for his comfort that Mr. Murray introduced in New York the first state coach the colonists had seen. It cost £15 : 14s., and was looked upon as an aristocratic innovation by those who could not afford such a luxury. Hence the time-serving old merchant was moved to speak of it as a leathern convenience, hoping thereby to stem the current of adverse criticism."

ANCIENT AND EXISTING STATE CARRIAGES.

Those who are curious in old carriages may have seen one exhibited in the South Kensington Museum (to which it was lent by the Earl of Darnley), and which may be regarded as famous because of the endeavour made in previous years to associate the carriage with Mary Queen of Scots. This coach, which was referred to in a previous chapter, answers very well to the description of the carriages of the time of Charles II. which Davenant speaks of as "uneasily hung and so narrow that I took them for sedans hung on wheels." The coach was long shown at Penshurst in Kent as the carriage presented by Mary Stuart to Lord Darnley. However, it is shown now as of English make early in the eighteenth century, and the freest estimate of its age would not place it farther back than the latter part of the seventeenth century. Be its period what it may, it presents a very interesting specimen of the ponderous inconvenient form, joined with sumptuous ornament, which our forefathers were accustomed to see in show carriages. The wheels are painted in red and gold, the sides are ornamented with the royal arms and paintings in the panels, the whole surface is elaborately carved, and on its summit are a number of gilt crowns.

In the Museum of the Hôtel Cluny, at Paris, are preserved a

number of antique carriages ; amongst them an Italian "carriole," built at Verona in the sixteenth century by Giovanna Batta Maretto, and painted by Vernicé ; also a state-carriage built at Bologna in the same century for Pope Paul V., and another built for the Farini family ; a state-carriage built at Milan for the French Ambassador there, *temp.* Louis Quatorze ; an English state-carriage, built by Holden Constable at London in the sixteenth century for the Prince of Wales ; a sledge, formed as a dragon and gilt, made for Louis XIV., and another sledge belonging to the queen of Louis XIII.

"These carriages," says Mr. George N. Hooper, in his Report on the Paris Exhibition of 1867, "will most of them be found full of interest, not only from their excellent state of preservation, but from the taste displayed in their ornamentation, and in many cases the chaste arrangement of their colours. The London carriage will be interesting to British subjects as showing that their countrymen several centuries ago could produce state carriages that would bear comparison with those of Italy, which country then stood at the head of many manufactures requiring skill and good taste. Practical coachmakers will probably also be surprised to find on one if not more of these carriages veritable C springs, supposed by most people to be a comparatively recent improvement." It may be useful to add to this, that

the modern adoption of C springs dates from 1804, when the invention of Obadiah Elliott, now much modified and improved, was introduced.

A number of notices of gorgeous and costly coaches are preserved by Beckmann. Quoting from Count Kevenbiller, he tells of the marriage of the Emperor Ferdinand II. with a Bavarian princess, when "the bride rode with her sisters in a splendid carriage studded with gold, her maids of honour in carriages hung with black satin, and the rest of the ladies in neat leather carriages." The same authority tells us that when the consort of the Emperor Matthias made a public appearance at her marriage in 1611, she rode in a carriage "covered with perfumed leather."

The wedding carriage of the first wife of the Emperor Leopold, who was also a Spanish princess, cost, together with the harness, 38,000 florins, but the biographer Rink, from whom this fact is drawn, speaks slightly of the carriages used by the Emperor himself. The coaches used by him are thus described :—

"In the imperial coaches no great magnificence was to be seen ; they were covered over with red cloth and black nails. The harness was black, and in the whole work there was no gold. The panels were of glass, and on this account they were called the imperial glass coaches ; on festivals the harness was ornamented with red silk fringes.

The imperial coaches were distinguished only by their having leather traces, but the ladies in the imperial suite were obliged to be contented with carriages the traces of which were made of ropes."

At the lesser court of Hanover greater magnificence was observed, as we are informed that at the court of Duke Ernest Augustus at Hanover there were in the year 1681 fifty gilt coaches with six horses each.

Beckmann also gives a description of a state carriage depicted in a picture by John Landwehr, painted in 1661, and seen by him in 1785 in the Senate House at Bremen:—"On the left side of the foreground I observed a long quadrangular carriage which did not appear to be suspended by leather straps. It was covered with a canopy supported by four pillars, but had no curtains, so that one could see all the persons who were in it. In the side there was a small door, and before there seemed to be a low seat or perhaps a box. The coachman sat upon the horses. It was evident from their dress that the persons in it were burgomasters."

From other sources we have glimpses of the magnificence and brilliance of the equipages in foreign countries early in last century. The practice of decorating the outside of the carriages with paintings and carvings was carried to great excess. Here is a description of French carriages, given in the *Spectator* (No. 15), in the year 1711:—

"When I was in France I used to gaze with great astonishment at the splendid equipages and parti-coloured habits of that fantastic nation. I was one day, in particular, contemplating a lady that sat in a coach adorned with gilded cupids, and finely painted with the loves of VENUS and ADONIS. The coach was drawn by six milk-white horses, and loaded behind with the same number of powdered footmen. Just before the lady were a couple of beautiful pages that were stuck among the harness, and by their gay dresses and smiling features looked like the elder brothers of the little boys that were carved and painted in every corner of the coach."

The sprightly traveller, Lady Mary Wortley Montague, writing from the East, shows that there the decoration of carriages was as common. She describes a coach she travelled in as "a good deal in the manner of the Dutch stage-coaches, having wooden lattices painted and gilded; the inside being also painted with baskets and nosegays of flowers, intermixed, commonly, with little poetical mottoes. They are covered all over with scarlet cloth, lined with silk, and very often richly embroidered and fringed. This covering entirely hides the persons in them, but may be thrown back at pleasure, and thus permit the ladies to peep through the lattices. They hold four people very conveniently, seated on cushions, but not raised." This was written from Adrianople in April 1717.

The wits and satirists of the day were not slow to notice the extravagance of the decoration of private carriages.

"Apollo stirs not out of door
Without his lackered coach and four,"

says the Dean of St. Patrick's, in the poem already quoted, alluding to the brilliant equipages of the day ; while a little later we encounter in the *Tatler* (No. 144) the following quip :—

"The young Bridegroom with his gilded *Cupids* and winged Angels has some Excuse, in the Joy of his Heart, to launch into something that may be significant of his present Happiness : But to see Men, for no Reason upon Earth but that they are rich, ascend triumphant Chariots, and ride through the People, has at the Bottom nothing else in it but an insolent Transport.

THE LORD MAYOR'S COACH.

The "Lord Mayor's Coach," dear to the memory of all who have seen the streets of the metropolis blockaded by the annual civic show, dates from the beginning of last century. Sir Gilbert Heathcote, in 1711, was the last Lord Mayor who rode in his mayoralty procession on horseback, since which time the civic sovereign has always appeared in a coach, attended by his chaplains, and the sword and mace bearers, the former carrying the pearl sword presented to the city by Queen Elizabeth upon opening

the Royal Exchange, the latter supporting the great gold mace given by Charles I. to the Corporation. The present coach, which is the most imposing feature of the modern show, was built in 1757, at a cost of £1065 : 3s. Cipriani was the artist who decorated its panels with a series of paintings typical of the virtues, etc., which may not inaptly be considered as the last relics of the ancient pageants, that gave their living representatives on each Lord Mayor's Day, to dole forth good advice to the chief magistrate of London.

An entry in the *British Chronicle* of Wednesday, 9th November 1757, states that Sir Charles Asgil, knight, attended by the aldermen, sheriffs, etc., went in a new state coach "drawn by six roan horses," to the Three Cranes, whence he went to Westminster in his barge. This was probably the first public use of the state carriage. The carriage was, it appears, built by a subscription amongst the aldermen of the day, and it was not till 1778 that it became the property of the Corporation. It was repaired and some adornments added about 1777, so that, though the paintings on the panels are attributed to Cipriani, this cannot be definitely ascertained. The heraldic devices are attributed to Catton, one of the original members of the Royal Academy, and coach-painter to George III.

The under-carriage, which is richly carved and gilt, has in front

a pair of marine figures supporting the seat of the driver, in front of which projects a large scallop shell, forming the foot-board. Above the hind axletree is a gilt framework, to which the braces supporting the coach are attached, and this frame has two griffins, with the city arms in the centre, supported by figures of commerce and plenty. The perch, painted Indian red picked out with gold, is double, and terminates in dolphins' heads. The wheels, resembling those of ancient triumphal chariots, are carved, and painted red, and partly gilded, with massive gilt bosses over the wheel-boxes. The coach is suspended with four thick black leather braces, fastened with large gilt brass buckles of spirited design, bearing the city arms. The roof, painted red, bears eight gilt vases, the centre one, formerly occupied by a group of boys with baskets of fruit and flowers, being now covered with the city arms, from which ornamental gilt scroll work trails over the roof. Above each door is a Phrygian cap of liberty, with wings, surrounded with scroll work, and between the upper and lower panels is a Roman trophy of helmets, spears, and flags. At the lower angles are dwarf figures representing the four quarters of the globe, and over the back panel are a serpent and a dove, typical of Wisdom and Innocence.

The front panel represents Faith, Hope, and Charity; Faith beside a sacrificial altar, supporting

Charity,—Hope pointing to St. Paul's Cathedral. The lower back panel shows 'the Genius of the City seated, Riches and Plenty pouring money and fruits into her lap, a ship in the background, bales of merchandise in front. The upper back panel shows the Genius of the City attended by Neptune, and receiving representatives of Trade and Commerce from all quarters of the globe; the Monument in the background. The right side door presents the Genius of the City throned, with sword and sceptre; Fame presenting to her a Lord Mayor, over whom she holds a wreath. On a table are the sword, mace, and cap of maintenance; old St Paul's forms the background, and small panels below show the staff of Mercury and horn of plenty. On the side panels here Truth and Temperance are figured. The left side door exhibits the Genius of the City standing, her right hand on the civic shield; Mars the especial deity of citizens, points to a scroll held by Truth, bearing the name of "Henry Fitzalwin, 1189," the first Mayor; the Tower of London, with shipping in the background, and on the small panel below are the city state sword and scales of Justice. The side panels show Justice and Fortitude. In shields at the lower angles of each door, and of the front and back panels, are emblazoned the arms of the Lord Mayor for the time being, and the city arms. The carriage was re-gilt in 1868, and in 1869

the paintings were carefully cleaned, obscuring coats of varnish being removed, and the coach was relined and provided with a new **hammercloth**. The above particulars are abridged from the official description of the coach in London Exhibition, 1873.

ROYAL STATE CARRIAGES.

The carriages of our own Royal Family are not less entitled to notice amongst famous coaches than that of the civic sovereign. It has been seldom the case, of late years, that the Queen has come forth in full state to open Parliament, with the "glass-coach," gilt and bedizened, built for George III., and the eight cream-coloured arabs, which curious visitors may see (in vulgar parlance, "eating their heads off") in the royal mews at Windsor. In opening Parliament, or in visits to the city, have been seen the chief royal pageants of the past century and a half, and we may begin our brief notice of those occurrences by quoting a description taken from the *Autobiography of Mrs. Delaney*, of the visit of George I. to the city in 1727 :—

"His own coach and horses that conveyed him to the Hall was covered with purple cloth ; the eight horses, the beautifullest creatures of their kind, were cream colour, the trappings purple silk, and their manes and tails tied with purple riband ; the Princesses horses were black, dressed with white ribands."

The State-Coach used by George III. in proceeding to the House of Peers, was a gorgeous affair, and is minutely described in the *Annual Register* for 1762. "The carriage is composed of four Tritons, who support the body by cables fastened to the roots of their fins ; the two placed on the front of the carriage bear the driver on their shoulders, and are represented in the action of sounding shells to announce the approach of the monarch of the sea ; and those on the back part carry the imperial fasces, topped with tridents instead of the ancient fasces. The driver's foot-board is a large scallop shell supported by bunches of reeds and other marine plants. The pole represents a bundle of lances, and the wheels are imitated from those of the ancient triumphal chariots. The body of the coach is composed of eight palm trees, which, branching out at the top, sustain the roof. The four angular trees are loaded with trophies allusive to the victories obtained by Britain during the course of the present glorious war. On the centre of the roof stand three boys representing the Genii of England, Scotland, and Ireland, supporting with their heads the imperial crown, and holding in their hands the sceptre, the sword of state, and ensigns of knighthood ; their bodies are adorned with festoons of laurel which fall from thence towards the four corners of the roof. The intervals between the palm-trees, which form the body

of the coach, are filled in the upper parts with plates of glass, and below with pannels adorned with paintings. On the front pannel is represented Britannia seated on a throne, holding in her hand a staff of liberty, attended by Religion, Justice, Wisdom, Valour, Fortitude, and Victory, presenting her with a garland of laurel; on the back pannel Neptune issuing from his palace, drawn by sea-horses, attended by the Winds, the Rivers, Tritons, Naiads, etc., bringing the tribute of the world to the British shore. On one of the doors are represented Mars, Minerva, and Mercury, supporting the imperial crown of Britain; and on the other, Industry and Integrity giving a cornucopia to the genius of England. The other four pannels represent the Liberal Arts and Sciences protected; History recording the reports of Fame and Peace burning the implements of War. The inside of the coach is lined with crimson velvet, richly embroidered with gold. All the wood-work is triple gilt, and all the paintings highly varnished. The harness is of crimson velvet adorned with buckles and other embellishments of silver gilt; and the saddle-cloths are of blue velvet embroidered and fringed with gold." Horace Walpole took a less exalted view of this carriage than the chronicler above quoted. He writes to his friend Sir Horace Mann, on 30th November 1762:—

"There is come forth a new

State Coach which has cost £8000. It is a beautiful object, though crowded with improprieties. Its support are Tritons, not very well adapted to land carriage, and formed of palm-trees, which are as little aquatic as Tritons are terrestrial. The crowd to see it on the opening of the Parliament was greater than at the Coronation, and much more mischief done." The carriage was designed by Sir William Chambers, and is stated to be "the most superb carriage ever built."

The fashion of giving to coaches the forms of allegorical device was common at the time referred to, as indeed it was at a much earlier time; for, did our space permit, the record of many fantastic equipages used for state, for public rejoicings, or for the expression of public feeling, might be adduced. Horace Walpole's criticism of the "improprieties" of the English state-carriage were applicable with almost equal force to the carriage built ten years later by the Russian merchants of London as a gift to their Empress. This carriage is described in the *Annual Register* for 1772:—

"A new coach is finished in an elegant manner and is to be put on board a vessel next Monday for Petersburg as a present from the Russia merchants to the Empress; it cost £1500. The body of the coach is supported by dolphins and mermaids; on the pannel of one door is curiously painted the Empress sitting in a triumphal car, surrounded with trophies of war, etc., on the pannel

of the other is a Turk in a sup-plicating posture, surrendering to the Empress the implements of war; and on the quarter pannels are painted coronets and crowns of laurel, and several other devices; the naves are gilt in such a manner that they appear like solid silver, and the spokes are carved and gilt."

ORIENTAL STATE CARRIAGES.

With a leap of fifty years, we come upon a still more wonderful carriage, eclipsing in its size and the animals who drew it anything seen in European records, yet evidently borrowing its style from European patterns.

The Maharajah of Mysore was, early in this century, wont to make progresses in a magnificent elephant carriage. Its interior was a double sofa for six persons, covered with dark green velvet and gold, surmounted by an awning of cloth of gold, in the shape of two small scalloped domes, meeting over the centre, and surrounded by a richly ornamented verandah, supported by light, elegant, fluted, gilt pillars. The whole was capable of containing sixty persons, and was about twenty-two feet in height. It moved on four wheels, the hinder ones, eight feet in diameter, with a breadth of twelve feet between them. It was drawn by six immense elephants, an exact *match in size*, with a driver on each, harnessed to the carriage by traces, as in England, and their huge heads covered with a sort of cap

made of richly embroidered cloth. The pace at which the elephants moved was a slow trot, of about seven miles an hour—they were very steady, and the springs of the coach particularly easy. The shape of the body was that of an extremely elegant flat scallop shell, painted dark green and gold. This magnificent carriage was the production of native workmen, assisted by a half-caste Frenchman.

Even the grandeur of this gigantic vehicle was eclipsed by the state carriage of the king of Burmah, which was captured by the British in the war of 1824-25. This carriage presented one entire blaze of gold, silver, and precious stones; the last named amounting to many thousands, including diamonds, rubies, blue and white sapphires, emeralds, amethysts, garnets, topazes, crystals, and the curious and rare stones known as "cat's eyes." The carriage stood nearly thirty feet in height, and like that of the Maharajah before described, was drawn by elephants. In form and construction, in its elaborate and superior carving, and its grand and imposing effect, this coach takes rank as one of the most splendid equipages in existence.

AN AUTOMATON MODEL CARRIAGE.

In opposition to these gigantic and gorgeous carriages, we may give the description of a toy equipage made by a Frenchman named Camus, for the amusement of Louis XIV. when that monarch

was a child. It consisted of a small coach drawn by two horses, in which was the figure of a lady, with a footman and page behind. This coach, being placed at the extremity of a table of a determinate size, the coachman smacked his whip, and the horses immediately set out, moving their legs in a natural manner. When the carriage reached the edge of the table it turned at a right angle, and proceeded along that edge. When it arrived opposite the place where the young prince was seated, it stopped, and the page getting down, opened the door; upon which the lady alighted, having in her hand a petition, which she presented with a courtesy. After waiting some time, she again courtsied, and re-entered the carriage; the page then resumed his place, the coachman whipped his horses, which began to move, and the footman, running after the carriage, jumped up behind it.

THE QUEEN'S CORONATION.

In the *Sun* newspaper, for Thursday, 28th June 1838, which was printed in letters of gold, and recorded the Coronation pageantry of Queen Victoria, a lengthened description is given of the royal and ambassadorial equipages on that august occasion. From this we extract one of the most striking, namely the carriage of the French Ambassador, Marshal Soult, Duke of Dalmatia; which, we are informed, created far more interest than that of any

other ambassador. The carriage was of French manufacture, of a rich cobalt colour, relieved with gold. The panels were superbly emblazoned with the arms of his Excellency, with the baton of a field-marshal and the order of the Legion of Honour. It had side lights [only another carriage in the procession is described as having side lights] and four elegant lamps, ornamented with the ducal coronet, of rich chased silver. The raised cornice was also of silver, and at each of the four corners was a ducal coronet of large dimensions. The lining of the interior was of rich nankeen satin, relieved with scarlet, and was fitted up in quite a unique style. The hammercloth was of blue broadcloth, trimmed with nankeen gimp and tassels, and with the arms of his Excellency exquisitely embroidered. The harness had beautifully chased silver furniture, and the liveries, of drab with rich figured silk lace." The carriages of the other ambassadors are described as magnificent, that of the Sardinian ambassador being characterised as "particularly remarkable for its symmetry and chasteness."

THE INFERNAL MACHINE.

Almost contemporary with this event, we encounter in the *Journal* of a famous gossipmonger, Mr. T. Raikes, a notice regarding other royal equipages, which deserves record. The time is March 1836, and the incident is subsequent to

the attempted assassination of Louis Philip by the "infernal machine" of Fieschi, when the citizen King apparently thought it advisable to take precautions against any similar attempt.

"A *piqueur*," says Mr. Raikes, "who attends the King's equipages when he takes a drive, told me the other day that all his carriages are now lined with plates of cast-iron." We shall see, in a subsequent part of this work, that others than kings have thought it necessary to adopt such a precaution!

EXISTING SPECIMENS OF GAUDY CARRIAGES.

Where shall such vehicles be seen as our forefathers were familiar with? There are many prints of such coaches preserved in histories, in memoirs, in the collections of *virtuosi*, and in public libraries. The *XVIII^{me}. Siècle* of Paul la Croix may be referred to as an excellent storehouse, where the antiquary or the student of manners will find much to repay study, not only in regard to the sumptuous character of the vehicles of the period, but in many other branches of court and social life. Reference may, for example, be made to the Moreau's print of 1782, reproduced by La Croix, in which *Les Grands Carrosses de la Cour* are represented, showing the fine glass coach, drawn by eight horses, passing between the lines of a dense crowd. But if the notes of

modern travellers are to be trusted, the very coaches themselves may to this day be seen in Spain, just as the archaic "Brown Bess" of last generation was to be found in that backward country, doing duty as the military arm of the day, long after every other army in the world had obtained Sniders, chassepots or needle-guns. The travelling equipages of Spain are described by Théophile Gautier, a well-known and brilliant French journalist, who visited that country in 1840, as "fantastic vehicles, covered with grey cupids, and other ornaments in the Pompadour style, dragged by four mules, and enhanced by the presence of a zagal in a tolerable masquerading suit." In another place M. Gautier describes the *correo real* as "an antediluvian vehicle, of which the model could only be found in the fossil remains of Spain, immense bell-shaped wheels, with very thin spokes, considerably behind the frame, which had been painted red somewhere about the time of Isabella the Catholic; an extravagant body full of all sorts of crooked windows, and lined in the inside with small satin cushions, which may at some period have been rose-coloured, and the whole interior quilted and decorated with a kind of silk that was once, probably, of various colours."

For the modern equivalents of those antique carriages *de luxe* we may turn to modern state-pageantry in vain, for although it may be true, as stated by Mr.

Hooper, that "the very highest types, and best specimens of modern British carriages may be seen when her Majesty holds courts or drawing-rooms at one of the London palaces;" and that "on such occasions the dress chariots, landaus, and coaches of the Queen, Royal Family, and British nobility are seen to the best advantage," we hardly, in the light-built vehicles of the nineteenth century, see any great resemblance to the heavily gorgeous caravans, of which mention has been made.

JOHN GILPIN.

A chapter on famous carriages would be incomplete without a reference to the celebrated vehicle borrowed by the London citizen of credit and renown, John Gilpin, from his friend the calender.

My sister, and my sister's child,
Myself and children three,
Will fill the chaise, so you must ride
On horseback after we.

Our illustration shows the home-coming of the party from that memorable excursion.

FANCIFUL COACHES.

We have spoken hitherto of some coaches which have become famous from their associations, or from the extravagance of their form and outward decoration. We now speak of a few inventions, in which peculiarity of form or conception, as apart from ornament, is the characteristic, and

the first that presents itself is the "high-flyer," or phaeton, introduced about the middle of last



century. This was a vehicle of four wheels, with the seat (which held two persons) elevated high in

the air upon uncouth-looking springs. Mr. Adams, who wrote a *History of Pleasure Carriages*, says, that "to sit on such a seat when the horses were going at much speed, would require as much skill as is evinced by a rope-dancer at the theatre. None but an extremely robust constitution could stand the violent jolting of such a vehicle over the stones of a paved street." The phaeton in this form is stated to have been a favourite driving carriage of the Prince of Wales (the "Finest Gentleman") while the "bucks" and "swells" of his day, who thought it great fame to astonish the common people by risking their own necks, held it in high favour. Travellers on this machine reached their places by means of a ladder, and it is stated that some of the phaetons had a ladder fixed as part of their equipment. Leigh Hunt furnishes a personal recollection of the phaeton in his essay on "Coaches and their Horses :"—

"The handsomest mixture of danger with dignity in the shape of a carriage was the tall phaeton, with its yellow wings. We remember looking up to it with respect in our childhood—partly from its own loftiness, partly for its name, and partly perhaps for the figure it makes in the prints to novels of the period." The element of danger in this elevated "chariot of the sun" seems to have led to the invention of expedients to lessen that danger, one of which, given in the *Annual Register* for 1766, may be quoted :—

"The Hon. Sir Francis Blake Delavel, Knight of the Bath, tried the experiment of his new-invented phaeton the other side of Westminster bridge, when he put his horses in a full gallop, and in a moment, by pulling a string, the horses galloped off and left him in the carriage, which stood still."

"We have no relish," wisely says Leigh Hunt, "for vehicles that are not safe. Danger is a good thing for giving a flip to a man's ideas ; but even danger to us must come recommended by something useful. We have no ambition to have *tandem* written on our tombstone."

Sometimes the "bloods" of last century were contented to avoid danger, and court only singularity. Thus, "Romeo" Coates, a famous beau of that time, is recorded to have had a curricule which was made of copper, and shaped like a nautilus shell.

In the period immediately preceding the time when the railway was to replace the coach as the great means of public conveyance, there appears to have been great activity in the minds of men in the search after some simpler, or speedier, or less costly means of transit. Much of this took the shape of endeavours to improve the mechanical structure of the carriage, or to find some means of moving it other than horse flesh. One desideratum of the period seems to have been to get rid of the horses, and the records of the

early part of the century are filled with designs to that intent. In 1823, a carpenter, residing at Buckland, near Chard, is stated to have invented a carriage of light construction, described as a "self-moving carriage," and which would travel without horses. It is recorded that this carriage "appears to answer the purpose intended," but we have not been able to obtain details of the invention. An ingenious fellow, J—— M—— of Coldstream, in Scotland, projected a "self-acting carriage," of which a drawing is given in one of the early volumes of the *Mechanics' Magazine*. In appearance, the body of this carriage is like a railway goods wagon, set very low, and its wheels are not unlike those with which Thomson's "Road-Steamer" have made us familiar. The long square body is, however, an air-tight reservoir, into which, by the arrangement to be described, the air is pumped by the revolution of the wheels. If the carriage had been able to start itself, "perpetual motion" would without doubt have been at last discovered, but the projector states that the air-box must be filled with compressed air to give it the first impulse. Inside each of the wheels are eight compartments, each containing a pair of bellows, communicating by valves through the axle with the air-box. On the outer circumference are a set of projecting knobs, which, on being driven in by the wheel passing round caused the bellows

inside to blow air into the interior. From the air-box there are pistons driving the wheels by means of a crank and chain. It was supposed that the four pairs of bellows, acted upon in each wheel as the knobs got pressed in, would drive as much air into the box as was required to drive the piston the corresponding distance—an ingenious theory, but presenting so many obvious mechanical and scientific difficulties, that one almost marvels how the editor of a scientific magazine should have admitted such a proposal to its pages. It was, however, but one of many curious and impracticable inventions that marked the activity of the period in the direction we have indicated. Another similar invention was the "Air-Carriage," projected by a Mr. Fordham of London, whose ingenious plan consisted of two air cylinders with connecting rods, communicating the power of cranks to the wheels. The "recipients" for the compressed air might be placed under the axle or in the body of the carriage, and it was stated by the inventor that when the air was condensed into the recipients it would remain there for months with unimpaired elasticity. The description of this carriage is followed by some curious comparative statements as to the relative cost of horse traction and the new system. The cost of drawing coaches by horse-power was stated at about two shillings a mile, while by condensed air it would probably be sixpence, and

in many cases only fourpence. In 1823 the writer goes on to say the number of miles gone over by stage-coaches (exclusive of the mails) was 33,199,000, and the probable number of miles run by stage-coaches, including the mails, is annually about 40,530,000. The cost of the horse-keep to the country for this service is stated as about £4,000,000 per annum, of which £3,000,000 might be saved, and while in making this saving "not a man need be thrown out of employment, a very improved method of travelling would be introduced." It is added that probably steam-carriages would succeed eventually, but gentlemen would no doubt prefer a clean and elegant air-carriage to one propelled by steam!

In 1820 a carriage with sails was exhibited at Paris. "The carriage was of English construction; and the object of the inventor was to substitute sails for horses. The mechanism is described as "simple and ingenious." Still more curious was another invention, of ten years later, which we find described in the *Leeds Mercury*. This was a newly-invented gig, drawn by a wooden horse, at the rate of a mile in six minutes, and carrying three passengers, which was exhibited at Keighley. The mechanism from which this extraordinary vehicle receives its impulse was the invention of Mr. Isaac Brown, of East Morton, near Bingley, and it is stated that the horse, though of such untractable materials,

might be guided in any direction by a single rein attached to the mouth.

THE THREE-WHEELED CHARIOT.

In another direction, departures from the normal or generally accepted form of a carriage (*i.e.* with wheels placed in pairs) have been numerous, and the inventions may in some respects be held as coming under the denomination of "fanciful carriages." The "three-wheeled carriage"—an invention offering a practical contradiction to the popular proverb as to the uselessness of the third wheel of a cart, was apparently designed to overcome an element of danger in the ordinary two-wheeled gig, in which so much both of the business and pleasure of travelling took place in the early years of this century. For the prevention of accidents through the stumbling of horses many other inventions, more or less ingenious, were also proposed, but the three-wheeled carriage would obviate one danger, in so far that the fore part of the vehicle would not come down suddenly when the horse fell, as was the case with the two-wheeled gig.

Dr. Nott, who filled the office of President of Union College, in the old Dutch town of Schenectady, in the state of New York, from 1804 to 1866, was a man of some scientific attainments, and amongst his inventions was that of a three-wheeled chariot.

He is described as one of the first to aid Fulton in his efforts to introduce steam navigation on the Hudson River, and as a man of distinction in the line of mechanical invention. "Associated with Union College for many years was a famous vehicle known as the 'Three-Wheeled Chariot,' in which the Doctor used to drive about. It was built at his suggestion, as a great improvement on the 'One Horse Shay.' The body of the vehicle was supported by the rear axle on the two wheels, while a third wheel in front was in close connection with the shafts, so that it revolved with them as they turned. By this arrangement the body of the carriage could be hung low, supported entirely by the wheels, while the third wheel in front, revolving in a small circle with the shaft, enabled the occupants to make a short and safe turn. Thus, the whole was a model of convenience and safety, and a favourite not only with its owner but with the students and the town. Nothing is left of it but an outline in the memory of those who saw the quaint affair in use. The 'boys' have a legend that the 'good old Doctor,' like Elijah of old, was thus transported to the heavenly land, and they yet sing :—

'Where, oh where, is the good old Doctor?

Where, oh where, is the good old Doctor?

He went up in the Three-Wheeled Chariot,

Safe into the Promised Land !'"

Numerous inventions of three-wheeled carriages are recorded about this time, but that of Dr. Nott (the description of which is borrowed from *Scribner's Monthly*) besides being probably the earliest, and certainly one of the few brought into practical use, may be accepted as typical of the rest. It was objected to such carriages that the leverage action of the fore-wheel upon the spindle rendered them defective in wear. If it be asked why they did not adopt the four-wheel principle, the question of the duty on carriages comes in. As bearing on this subject, we obtain from one of the Long Acre authorities of half a century ago, a description of a new four-wheeled vehicle he had seen in Paris, remarkable for safety, ease and lightness, as well as simplicity of construction, and which he adds "can be made to evade whatever duty is imposed on the common four-wheeled vehicles."

A SIX-WHEELED CARRIAGE.

The "six-wheeled carriage," proposed by Sir Sidney Smith, also deserves notice, as a departure, for substantial reasons, from the normal number of wheels. The six wheels were equal in size, and the front and back pairs revolved upon an axletree. These pairs were joined together in such a way by braces that when the fore axle turned to the left, the hind axle turned to the right, and *vice versa*, so that the carriage turned

round in a very small space. But for this coupling of the pairs of wheels, the carriage might have been pronounced the exact forerunner of the "bogie" principle as applied to railway carriages and engines, by which means vehicles of immense length are enabled to travel over curves of small radius. It was stated by the projector of this ingenious carriage, that its great advantage over the ordinary four-wheeled carriage was the ease and facility with which it travelled over rough or uneven roads, as the leverage upon the centre wheels preserved the body from violent action. It was particularly recommended as a military invalid carriage, or as a sporting carriage for crossing the open country. Though ingenious and scientific in its structure, the carriage cannot be traced as having been received with favour, or adopted to any considerable extent.

THE CHAR VOLANT.

The patent "Char Volant," or carriage drawn by kites, invented by Colonel Viney and Mr. George Pocock, may justly be described as a fanciful carriage. "We are aware," says the editor of the *Arcana of Science*, who gives a plate of the *Char Volant*, "that kites have been employed to assist in swimming, by Dr. Franklin, who considered that with such an aid a man might swim across the channel from Dover to Calais, and that attempts have been made to

move both boats and cars by the same means; the patentees of the present apparatus, however, have first introduced methods of regulating the force of the wind, and of varying the direction of its action on the machine to be used." The kite affixed to this carriage was a species of parachute, with strings passing from its circumference through a ring, and so to the persons in the car. By pulling these cords the superficies of the kite might be lessened, or by pulling those on one side the wind could be made to turn the carriage to right or left, and so on. That no great faith was placed in the invention may be judged from the subsequent statement that "the patentees propose to attach occasionally to their car a platform on small wheels, for the purpose of carrying a pony, to be employed in dragging the machine in cases where the kites cannot be applied."

PREVENTION OF ACCIDENTS.

The question of accidents, as we have stated, seems to have been ever present with those who aimed at improvements on the gig, and the following curious letter to the editor of the *Mechanics' Magazine* in 1825, shows the direction in which men's minds were running:—

"A SAFETY GIG. Sir—Is it possible to construct a Safety Gig (built much like a Stanhope or tilbury) so that the shafts should be always in a horizontal position, or nearly parallel with

the ground, whether the horse was in the gig or not? Or one, the body of which should always be in its proper position (the same as when people are sitting in it), but the shafts of which should move on hinges, so that they could rest on the ground (when no horse was harnessed to them) without at all affecting the upright position of the body or seat of the gig? When a horse tumbles in a gig, the shafts go to the ground with the animal, and by being connected or annexed to the body of the gig, that also is clogged up, so that those sitting in the gig are violently precipitated forwards, by which many lives have been lost, and the most serious injuries occasioned. The great object is to prevent the motion (up or down) of the shafts from having any effect or power over the motion of the body of the gig, which would be *by no means difficult if a gig were not a two-wheeled vehicle*. The horse might then fall to eternity, and those sitting in the gig remain perfectly quiet and uninjured."

The words put in italics convey the idea that the writer of the letter must have been a Hibernian! The whole difficulty would undoubtedly have vanished if a four-wheeled vehicle were used. But other means of evading the danger were industriously sought after, and we may notice the "safety irons" (being a continuation of the step, in a kind of scroll form, to within an inch or two of the ground), invented by Williams of

Bethnal Green; also the proposal of Mr. Dixon Vallance to put two small wheels running on the ground, in continuation of the step iron, which practically made the vehicle a four-wheeled one, though each of the fore-wheels could plead that it was "a very little one." There was also a modern adaptation of the plan of Sir Francis Blake Delavel for instantly releasing the horses of his high-flyer phaeton—referred to in an earlier paragraph—which was done in 1825 by the Long Acre coachbuilder quoted above. In his invention the horse was released and could run off with the harness, leaving the vehicle, shafts and all, at a stand. As an illustration of the feeling that actuated—perhaps still actuates—those who delight to handle the ribbons of their own vehicle, it was made an objection to some of those inventions that to adopt them would be a public admission that one was "driving a horse that was not able to keep upon its legs."

Curiously enough, such inventions re-appeared thirty years later in the International Exhibition at Paris in 1855, and in chronicling this fact we have an expression by the reporter, showing that the dislike of anything like an insinuation of fear or incapacity in managing horse-flesh, is deeply engrained in the English character. The circumstances are thus narrated by Mr. Hooper in his Report on the Carriage Department of the Paris Exhibition:—



"France exhibits several plans for detaching runaway or fractious horses from carriages, but they all seem to have the objection that the horses may become detached by accident, and probably cause the evil they are intended to avoid. It would be better for French drivers to attain greater perfection in their calling. They seem to drive in the most careless manner possible, almost always with loose reins, not keeping a sharp look-out in front or on their own side of the road. It is not uncommon for the driver of a diligence to sit on the reins of the five horses he is driving, while with the whip in both hands he lashes his rough stallions, each in his turn, and in proportion to his merits. While such driving continues, accidents must be unavoidable. The English show no plan of this kind. It may be perhaps inferred from this circumstance that drivers rely more on nerve and self-possession with restive horses, than on makeshifts to get rid of their charge on the outbreak of hostilities."

THE IRISH "NODDY."

From Ireland, as might be anticipated, some curious contrivances in the way of vehicles may be obtained. One of them, very ancient in form, has been figured in an earlier chapter. Even more uncouth vehicles than a large long flat board upon two wheels, have been seen in that country. For example, we cull from an Irish

newspaper of January 1821 the story of an old man of 96 who, for a wager, travelled from Lis-more to Fermoy in an oyster tub, drawn by a pig, a badger, two cats, a goose and a hedgehog, with a large red nightcap on his head, a pig driver's whip, and a cow's horn, the latter of which he blew to encourage his team and give notice of his approach, after the fashion of a post-boy.

Apart from such unusual vehicles as the last, however, the description of an Irish "Noddy" of the beginning of the century, and given in *Blackwood's Magazine* for 1826, may be quoted:—"A chaise and pair, miserable in show and substance as both really were, was a species of luxurious conveyance to which the ambition of the middle class of travellers in Ireland before 1800 never ventured to aspire. Such as were content with a less dignified mode of travelling on wheels, the city of Dublin accommodated with a vehicle unparalleled I believe in any part of the world, and singular in name as well as construction. It was called a 'Noddy,' drawn by one horse, and carrying two, or if not of overgrown dimensions, three passengers. The body of this 'leathern convenience,' which bore some resemblance to an old-fashioned phaeton, 'beetled o'er its base' in front, the better to protect the inmates; and being slung from cross-bars by strong braces instead of springs, nodded formidably at every movement of the horse, hence deriving the

appropriate appellation of Noddy. In case of rain blowing in, a curtain of the same material afforded its friendly shelter, wrapping the passengers in total darkness, though, as far as prospect was concerned, the inconvenience was little; the only visible object when it was withdrawn being the broad back and shoulders of the brawny



driver, who rested his legs upon the shaft, and his sitting part on a sort of stool a very little way removed from the knees of the person seated within. Simple, awkward, and uneasy, as this contrivance was, it was not disdained even by senators at an earlier period than that of which I write; and a nobleman, some thirty years

older than myself, too, of high rank and large estate assured me that it was his usual conveyance to and from college accompanied by a trusty servant or private tutor."

VARIOUS NATIONAL VEHICLES.

The mind is so apt to consider everything "fanciful" which does not present itself with the known air of familiarity, that perhaps it may not require apology to present here the following interesting notes on the carriages characteristic of various nations in our own day, drawn from the admirable reports on the various International Exhibitions drawn up and recently reprinted by Mr. George M. Hooper. The notes refer to *L'Exposition Universelle* at Paris in 1867, in which there was a large collection of modern carriages from various countries, each of them having some specialty adapted to the climate, the state of the roads, or the habits of the people where they were contrived and used :—

"The 'sledges' were of course only used in cold climates, where they could travel over ice and snow.

"The 'tarantas' of Russia has great strength, compactness, and capacity for carrying luggage, provisions, and bedding, besides tools and spare parts to make good breakages and losses. It is a difficult problem cleverly solved—namely, How many comforts and conveniences can be combined in a carriage without rendering it too

heavy or too complicated? The answer is the carriage itself, which must be judged of solely for the purpose intended, and not by the standard of Western Europe, where good roads and hotels are abundant. Thus, in a thinly inhabited country, there must be space for provisions, bedding, firearms, mosquito-nets for summer, and secure shelter from the severe snowstorms of winter, and tools and spare parts in case of upsets and breakages, together with boxes for clothing and other things that are usual for travelling carriages."

Every traveller does not share this idea that the "tarantas" is a model of comfort and convenience. Madame Pfeiffer, for example, says, in her *Journey round the World*: "We travelled certainly with speed; but any one who had not a body of iron, or a well-cushioned spring carriage, would not find this very agreeable, and would certainly prefer to travel slower upon these uneven, bad roads. The post carriage, for which ten kopecs a station is paid, is nothing more than a very short wooden open car, with four wheels. Instead of a seat some hay is laid in it, and there is just room enough for a small chest, upon which the driver sits. These cars naturally jolt very much. There is nothing to take hold of, and it requires some care to avoid being thrown out. The draught consists of three horses abreast; over the centre one a wooden arch is fixed, on which hang two or three bells,

which continually made a most disagreeable noise. In addition to this, imagine the rattling of the carriage, and the shouting of the



driver, who is always in great activity urging on the poor animals, and it may be easily understood that, as is often the case, the carriage arrives at the station without the travellers."

To resume Mr. Hooper's notes, we read—"The 'char-à-côté' of Switzerland is long, narrow, and light, and is well adapted for traversing the mountainous roads of that picturesque country.

"The 'carriole' of Norway is light, inexpensive, and doubtless well adapted for the simple wants of a primitive people in a mountainous and thinly inhabited country.

"The 'spider phaeton' of America is said to be admirably adapted to the wants of the people of the United States and some of the Australian colonies. It is so light and elastic that it bends and gives way under usage that would break a stiffer and heavier carriage.

"The 'chariots' of France help to keep up the state and ceremony that appertain to an imperial court in the midst of a magnificent city. Its 'barouches' carry the gaily dressed ladies of Paris to the Bois de Boulogne on bright summer afternoons. Its 'cabriolets' are now nearly obsolete, but will probably again soon come into use among the '*jeunes gens de Paris*,' as they are elegant and stylish carriages for those who keep good horses and know how to drive well.

"The 'drags' from England are a never-ending attraction to crowds of admiring visitors, to a large proportion of whom they are an entire novelty; and of all 'national' carriages they receive the most attention. Thanks to the French and British Commissions, they are very well placed

near one of the large entrances. They are very characteristic of country life in England, where, as a rule, the pastimes and pleasures of the country are preferred to the gaiety and excitement of the towns. In England at the present time, however, such carriages are used for driving in the London parks, for attending horse-races, for going to or from cricket-matches, for picnics, and many other purposes connected with life at the mansions and country seats of the English nobility and gentry. As such carriages are very frequently taken considerable distances from home, and to places where it is difficult to procure suitable refreshment, a luncheon is on such occasions taken with the carriage; and it has been usual to spread it on a tablecloth placed on the grass, and for the company to sit round and partake of it. As the grass is frequently damp, and may not only be uncomfortable, but dangerous to health, there is shown on one of the English drags an improved means for serving the luncheon with more comfort. This has been accomplished by making the boot doors and the sides of the front boot fall down and form tables. A folding mahogany table passes through the body, projecting at the doors. The lunch, glass, plate, wine, etc., are all carried in suitable boxes, baskets, and ice-wells, neatly contrived so as not to interfere with the perfectly neat and gentlemanly appearance

of the carriage ; a point on which English gentlemen are extremely sensitive and particular.

"The English 'dog-carts' are essentially country carriages, and are nearly all made in the provinces. They are used for conveying sportsmen and their dogs on shooting expeditions, and are in general use throughout the country by gentlemen, farmers, and tradesmen.

"The 'broughams,' first used by and named after the celebrated Lord Chancellor Brougham, are most especially used in London and the English towns. Their use in the country has much increased of late years, as they are now built much lighter than formerly.

"The 'mail phaetons' are much used by gentlemen who like driving their own horses both in London and in the country. It is the most convenient and suitable carriage for a gentleman to drive with a pair of horses.

"Irish cars away from their native soil are an anomaly. Even the English do not understand and appreciate them, and much less can it be expected that foreigners should do so. They will carry four or five persons with luggage, and are so well balanced and so hung that a horse will do a long journey without fatigue. Their use is universal throughout Ireland, and after a few drives strangers get accustomed to the position of the seats which at first seems strange. The same principle of construction

has been applied to cars on four wheels for two or four horses, and under the enterprise of Mr. Bianconi have done much to improve the communication between distant parts of Ireland."

The list closes with Tunis, whence is sent a humble coach on two wheels, such as one might fancy would just suit the Queen of the Gipsies—not much more dignified than the characteristic Welsh market-cart, a representation of which is given on the following page.

The notes of Mr. Hooper convey almost all that it is necessary to say regarding the carriages of modern times, unless it be to remark on the fact how much lighter in build carriages of all kinds have become even in our own day ; Mr. Hooper remarking that between the 1851 and 1862 Exhibitions in London there was probably a diminution of one-fourth in the weight of the carriages shown by British makers, while in 1873 the carriages shown in London were even lighter than those of 1862 and 1867.

THE WAGGONETTE.

There are two other modern forms of private carriages which deserve special notice here. The first, or nearly the first, "waggonette," a vehicle now so universally in favour, was built in 1845 under the personal direction of the late Prince Consort for the use of her Majesty and the Royal Family. This waggonette had

many ingenious contrivances suggested by the Prince, with whom and her Majesty it always remained a favourite carriage for country excursions. There are now so many varieties of carriages of this type, and so much ingenuity has been bestowed on them, that

it can hardly excite surprise that they are much appreciated by those who use carriages, especially in hilly parts of the country, where a compact, serviceable, and economical carriage is in many cases indispensable. "They possess," says Mr. Hooper, "the



advantage of carrying a greater number of persons on a carriage of given weight than any other on four wheels."

THE PERAMBULATOR.

The other coach is the child's carriage, with regard to which

persons of middle age can well remember how clumsy and difficult to draw were the coaches then in use in their young days. The authors of the *Rejected Addresses* have immortalised this old and quaint form of vehicle in the imitation of Wordsworth:—

The chaise in which poor brother Bill
Used to be drawn from Pentonville,
Stood in the lumber-room.

I wiped the dust from off the top,
While Molly mopped it with a mop,
And brushed it with a broom.



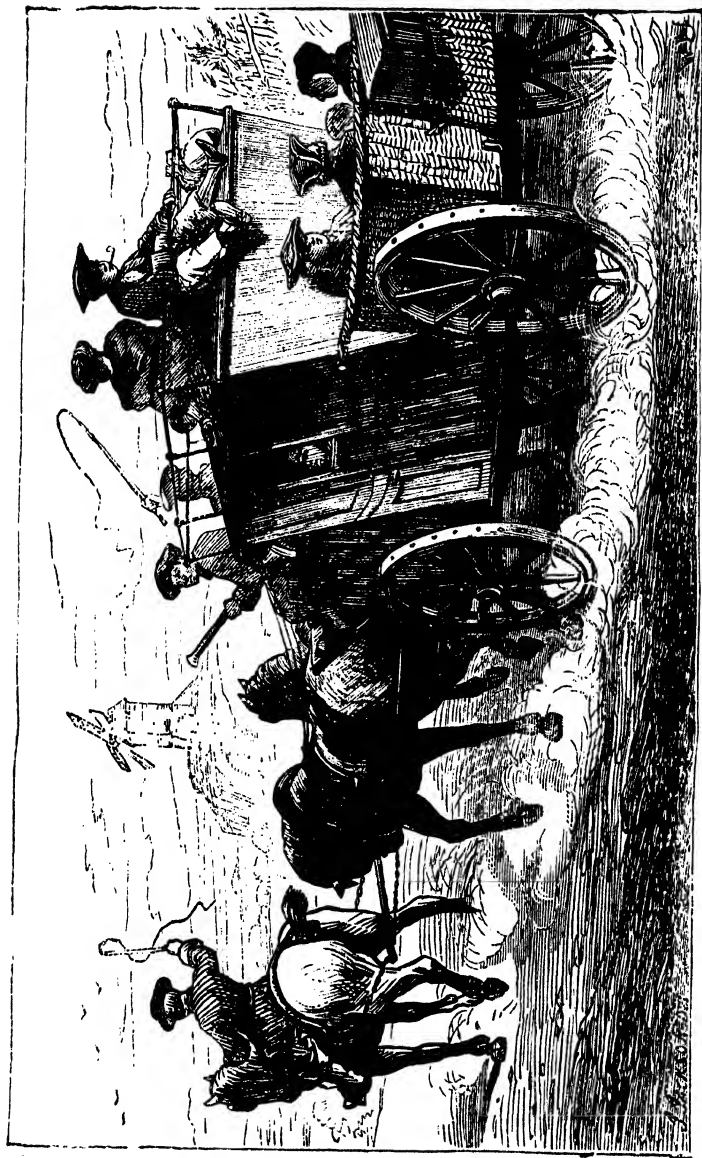
The vehicle associated with Lindley Murray (as noted in a previous page) and with Wordsworth was, about twenty years

ago, fairly extinguished by the perambulator. "The little vehicle so well known to all, the perambulator," says Mr. Hooper, writing

of the 1862 Exhibition, "is a somewhat recent innovation, probably since the Great Exhibition of 1857. From the immense number that have been made, and continue to be made, they have evidently filled a gap that had long waited to be suitably filled. Not only were the children's carriages of former times (made on four wheels, and to be drawn instead of pushed) hateful to most servants that had

to draw them, but they were the cause of occasional ill-feeling between children's nurses and their employers. The perambulator fortunately was invented, and restored harmony; they not only are light and convenient little carriages, and, if well made, durable, but (with ordinary precautions) almost indispensable to the parents, nurses, and children of the rising generation."





STAGE COACH—EIGHTEENTH CENTURY.



THE STAGE COACH.

CHAPTER I.

When late their miry sides stage coaches show,
And their stiff horses through the town move slow.

GAY's *Trivia*, i. 25, 26.

FIRST RECORDS OF STAGE COACHES—THE STAGE WAGGON—FIRST STAGE COACHES IN BRITAIN—PICTURES OF STAGE-COACH TRAVEL IN THE EIGHTEENTH CENTURY—A STAGE COACH AND ITS OCCUPANTS.

FIRST RECORDS OF STAGE COACHES.

THE stage coach, successor to the old stage waggon, may, in a rough way, be stated to have preceded the mail coach by a century ; while now, at the end of a second hundred years, the mail coach, as a distinct institution, has become a thing of the past. Here and there throughout the kingdom regular stage coaches still ply, but they have as a rule been superseded by the railway, or replaced by the jolting 'bus which carries the passenger from the railway station to the adjoining town or village. Much that has been said about coaches and roads in the previous chapter is also applicable to stage coaches, but there remains something sufficiently distinctive in the history of the stage coach and the mail coach to form in itself an interesting subject of inquiry. The distinction between the coach and the stage coach was and is, that while the one was maintained

for the private benefit of its owner, the other was put upon the road as a commercial speculation, and was open to the use of all who could meet its charges. There is here a very decided characteristic, wholly wanting in the railway system that has since sprung up, for railways are wholly constructed for public use, so that while they represent the stage coach and mail coach, they fail as successors to the private carriage, or even to the post-chaise, which was a carriage rendered private *pro tem.* by the will of the hirer. For a very early illustration of the existence of stage coaches, we can go as far back as the sixth century, when there were under the Merovingian kings posts belonging to the State. We read in Gregory of Tours that Chilbert II., who reigned from 576 to 596, having been informed that the Duke Rauching wished to kill him, sent

to bring the duke before him. Then he sent orders, and men furnished with letters which put at their disposal the public carriages (*voitures publiques*), to seize upon the goods of Rauching wherever they could find him. The history of stage coaches, however, must be held to commence at a much later date, and prior to them we encounter an older form of public conveyance in the waggon.

THE STAGE WAGGON.

The line of demarcation when stage waggons ceased and stage coaches began in Britain cannot be defined, for the period of the one overlapped that of the other. The waggon was certainly a century earlier than the coach, but it existed up till far on in the eighteenth century to compete with the swifter (and we presume dearer) stage-coach as the means of popular conveyance. The ordinary broad-wheeled tilt-waggon, as a method of conveying merchandise, of course subsisted much longer, and may even, with its long team of heavy horses, be seen on the streets of London in the present day. But our references are to the waggon as a recognised means of passenger-conveyance, and though there are doubtless still persons glad of a lift on a passing waggon on our bye-roads of communication, its days as a public conveyance are long since numbered with the things of the past.

As regards the relative period

of the introduction of stage waggons and stage coaches, our rough limit of a century between each may be accepted when we ascertain from Stow that, in 1605, long waggons for passengers and commodities travelled to London from Canterbury and other large towns. He also adds that they were known as early as 1564. It is scarcely necessary that we should dwell upon the old stage waggon, yet a few extracts illustrative of their use may serve to point strongly the contrast between the earlier and later centuries of post-mediæval times.

A Frenchman of letters, whose name is variously quoted as Sorbeire or Soubrière, and who came to England in the reign of Charles II. for the purpose of being introduced to the king, says of his journey:—"That I might not take post or be obliged to use the stage coach, I went from Dover to London in a waggon; it was drawn by six horses, one before another, and drove by a waggoner who walked by the side of it. He was clothed in black and appointed in all things like another St. George; he had a brave mounteron on his head, and was a merry fellow, fancied he made a figure, and seemed mightily pleased with himself."

"The Lover of his Country," whom we have before quoted, had no violent objection to these "long waggon coaches," as he calls them. He admits that *they* can plead some antiquity; because "they were first set up." Besides this,

compared with the objects of his hatred, the stage coaches, they were innocent things as regards speed :—"They travel not such long journeys, go not out so early in the morning, neither come in so late at night; but stay by the way, travel easily, without jolting men's bodies or hurrying them along as the running coaches do."

The stage waggon was almost exclusively devoted to the conveyance of merchandise, though carrying passengers under the tilt, and on the principal roads, it is said, strings of waggons travelled together, probably for mutual protection and society, like the caravans of the desert. A string of stage waggons travelled between London and Liverpool, starting from the Axe Inn, Aldermanbury, every Monday and Thursday, and occupying ten days on the road during summer, and generally about twelve in the winter season. Besides these conveyances, there were strings of horses travelling somewhat quicker, for the carriage of light goods and passengers. The stage waggon travelled much slower on other roads than they did between London and Liverpool. On most roads, in fact, the carriers never changed horses, but employed the same cattle throughout, however long the journey might be. It was indeed so proverbially slow in the north of England, that Mr. Lewins, in his volume on *Her Majesty's Mails*, narrates that when the publicans of Furness, in Lancashire, saw the conductors of the travelling mer-

chandise trains appear in sight on the summit of Wrynose Hill, on their journey between Whitehaven and Kendal, they were said to begin to brew their beer, always having a stock of good drink manufactured by the time the travellers reached the village. Every means of conveyance, however simple or primitive, has in it elements of danger. Whatever may be the agency by which personal locomotion is produced, says Dr. Lardner, it has always been attended with more or less danger to life and limb. Even the stage waggon was not exempt, as for example the case mentioned in the *Annual Register* for 1759, when the Worcester waggon, owing to the bursting of a bottle of aquafortis amongst its contents, was burnt, with a loss of £5000 in value, though no damage to the passengers is recorded.

Not much more than a century ago there was still a vehicle moving on the Great North Road, in which passengers, who called themselves gentlefolks, were travelling from York to London at the charge of a shilling a day—reaching their destination in about a fortnight. The description which Smollett gives of his journey to London is known to have been founded on personal experience. He and his faithful friend Strap, having seen the waggon a quarter of a mile in front of them, quickly overtook it, and getting into the conveyance by a ladder, tumbled into the straw under the darkness of the

tilt, in the midst of four passengers, two gentlemen, and two very genteel ladies. When they arrived at the inn where they were to put up for the night, Captain Weazel and his wife desired a room for themselves, and a separate supper; but the impartial landlord answered that "he had prepared victuals for the passengers in the waggon, without respect of persons." Roderick agrees to give ten shillings for his journey to London, if Strap, who was to walk alongside, would change places with him when he was inclined to walk. The blunders, the disputes, and the mirth of the passengers, are related by the writer with a vivacity which might be admired if separated from its coarseness. They got tolerably friendly after the first few days' jolting in the straw. Nothing remarkable happened during the remaining part of their journey, which continued six or seven days longer. At length they entered the great city, and lodged all night at the inn where the waggon put up.

In 1758 a stage waggon was established to travel between Glasgow and Newcastle. It was drawn by six horses, and started from the Gallowgate in Glasgow. That it was meant to be in connection with waggons still at that time travelling between Newcastle and London, is shown by an advertisement in the *Glasgow Journal* for 18th September 1758, to "acquaint gentlemen, tradesmen, etc., that the Newcastle-upon-Tyne

new Stage Waggon sets out from the Swan with Two Necks, Lad Lane, London, every day," and that it delivered goods, *passengers*, etc., "sooner by two days than any other waggon."

This might almost be looked upon as amongst the last records of waggon travelling, yet that the system was not disposed to die out quietly may be guessed from the fact that about this time efforts were being made to improve the waggon. From the *Annual Register* of 1764 we learn that "A waggon newly invented by Mr. Bourne, with wheels but two feet high, so as to go under the body, and sixteen inches broad, and which had already made two journeys between Leonminster and London as a stage, was tried on the new road, Islington, before several of the gentlemen belonging to the Society of Arts, etc., against a common broad-wheel waggon. Each of them had five tons weight of stone, and was drawn by eight horses, and the two carriages went abreast from the new road just by Pancras, to within a small distance of the Dog-house bar. On their return they were tried with four horses each for a little way, when it appeared that the common broad-wheel waggon had greatly the advantage, and that the four horses in it did not work seemingly harder than the eight in the new-invented one. Mr. Bourne's waggon does not seem calculated for roads that are uneven, or for steep ascents; but, on the other hand, by the situation of the

wheels, it can pass on narrower roads than the broad-wheel carriages, and can turn in very little space and without difficulty." For a waggon that could not go over roads that were uneven or up steep ascents there was not much use. Mr. Bourne's improvement, therefore, went the way of all attempts to improve that which is doomed to extinction, and the stage waggon was, as a means of passenger-conveyance, improved off the face of the earth.

FIRST STAGE COACHES IN BRITAIN.

The earliest stage coaches in Britain are probably discoverable in Scotland, as it is recorded in Brewster's *Encyclopædia*, that in 1610, Henry Anderson, an inhabitant of Stralsund in Pomerania, offered to bring from that country to Scotland coaches and waggons, with horses to draw and servants to attend them; accordingly a royal patent was granted him, conferring an exclusive privilege for fifteen years of keeping coaches to run betwixt Edinburgh and Leith.

So far as England is concerned, one of the earliest notices of a stage coach is in 1659, as we learn from Sir William Dugdale's diary, that he started from Coventry on the 2d of May in that year, and arrived in London on the 4th of May. He says, "I set forward towards London by Coventry coach." In other parts of his diary we come upon such extracts as the following :—

"1663, Jan. 30. By St. Albans coach to London.

"1679, July 16. I came out of London by the stage coach of Bermicham (? Birmingham) to Banbury.

"1680, June 30. I came out of London in Bedford stage coach to the Earle of Aylesburie's house at Ampthill."

Writing eight years later than the first extract given from Sir William Dugdale (namely, in 1637), Antony à Wood tells that he took two days to go from Oxford to London "in a stage coach." A few years later this passage was accomplished by a conveyance called the flying coach in thirteen hours; but between Michaelmas to Lady Day (that is to say, in winter) in 1692 it still occupied two days. The hours of the journey of this coach were altered by the almanac, "either from the badness of the roads or fear of highwaymen," says Wood.

The diary of a Yorkshire clergyman shows that during the winter of 1682 the stage coach was four days on the road between Nottingham and London. The conveyance was not "popular" in those days in the sense of being attractive to the people who used it. Travel by coach was rarely undertaken except under the pressure of necessity, and one traveller seems to have agreed with the "Lover of his Country," formerly quoted, in despising the stage coach—looking back, doubtless, on the pleasures of travelling on horseback. This was Mr. Edward Parker, who, writing

in 1673 to his father, (who lived near Preston), says, "I got to London on Saturday last. My journey was noways pleasant, being forced to ride in the boot all the way. The company that came up with me were persons of great quality, as knights and ladies. My journey's expense was thirty shillings. This travel has so indisposed me, that I am resolved never to ride up again in the coach."

The writer of "The Grand Concern of England," in the *Harleian Miscellany* (1673), declares that "these coaches and caravans are one of the greatest mischiefs that have happened of late years to the kingdom, mischievous to the public, destructive to trade, and prejudicial to lands. First, by destroying the breed of good horses, the strength of the nation, and making men careless of attaining to good horsemanship, a thing so useful and commendable in a gentleman. Secondly, by hindering the breed of watermen, who are the nursery for seamen, and they the bulwark of the kingdom. Thirdly, by lessening his majesties revenue." It was further stated that "those who travel in these coaches contracted an idle habit of body, became weary and listless when they had rode a few miles, and were then unable to travel on horseback, and not able to endure frost, snow, or rain, or to lodge in the fields."

This complainant also dwells on the evil, that the passage to

London being so easy, "gentlemen come thither oftener than they need, and their ladies with them, or quickly follow them by the same conveyance;" while the poor "cannot be profited thereby, for waggons or the long coaches first invented, and still in use, would be most for their interest to travel in, being far less expensive than the other."

In Chamberlayne's *History of Great Britain*, in 1673, a different view is taken, as he speaks of the recent invention as of "such admirable commodiousness both for men and women, to travel from London to the principal towns in the country, that the like hath not been known in the world, and that is by *stage coaches*, wherein one may be transported to any place sheltered from foul weather and foul ways; free from endamaging of one's health and one's body by hard jogging or over-violent motion, and this not only at a low price (about a shilling for every five miles), but with such velocity and speed in one hour as that the posts in some foreign countries cannot make in one day."

Some ground for the latter remark may be found in the fact that, according to Madame Sévigné, a journey from Paris to Marseilles, in 1672, required a whole month; while even in 1772, according to the same authority, matters were not much mended.

Mr. Lewins, in *Her Majesty's Mail*, speaking of the earliest coaches, says :—"A kind of *stage*

coach was first used in London about 1608 ; towards the middle of the century they were gradually adopted in the metropolis, and on the better highways around London. In no case, however, did they attempt to travel at a greater speed than three miles an hour. Before the century closed, stage-coaches were placed on three of the principal roads in the kingdom, namely those between London and York, Chester, and Exeter." In 1696 the Treasury sanctioned an arrangement for conveying the mails between Exeter and Bristol twice a week, under a stipulation that the distance of 65 miles should be performed in 24 hours. The journey would not be constant during the time, so that in some parts a speed in excess of 3 miles an hour would be attained !

At a hotel in York, in 1703, a placard was shown with the announcement, "that on 18th April 1703, persons who desire to make the journey from London to York, or from York to London, are requested to present themselves at the *Black Swan*, in Holborn, London, or at Coney Street in York. They will find there a diligence which leaves on Monday, Wednesday, and Friday, and accomplishes the entire journey in four days, if God permit."

It is noted by Mr. Smiles that the stage coaches about this period were laid up during the winter, "like ships during Arctic frosts ;" and an old writer, who, about 1700, extols the convenience of these

conveyances, perhaps affords a casual corroboration of this statement when he says :—"Here one may be transported, without over-violent motion, and sheltered from the injuries of the air, to the most noted places in England, with so much speed that some of these coaches will reach above fifty miles in a summer day." "Sometimes," as Mr. Lewins states, "the roads were so bad, even in summer, that it was all the horses could do to drag the coach along, the passengers, per force, having to walk for miles together. With the York coach especially, the difficulties were really formidable. Not only were the roads bad, but the low Midland counties were particularly liable to floods, when, during their prevalence, it was nothing unusual for passengers to remain at some town *en route* for days together, until the roads were dry." This is illustrated by the following statements from the *Annual Register* for 1766 :—

"The North mail, which should have arrived on Sunday evening at six, did not arrive till five on Monday evening ; that which should have come in on Tuesday at the same hour did not arrive till Wednesday nine in the morning ; that which should have arrived on Thursday at six in the evening did not come in till past eleven on Friday, owing to the floods." And again :—"Yesterday morning, about four o'clock, the North mail-cart, going through Tottenham Washway, was

under water; the horse was drowned, and the boy with great difficulty saved."

PICTURES OF STAGE-COACH TRAVEL IN THE EIGHTEENTH CENTURY.

The act of stage-coach travelling was not, up to the last, an agreeable or a convenient one. In the earlier days of the coaches, no one travelled during the night, and the practice of so maintaining the journey, which came into vogue about 1740, was of course made the subject of serious objection. The previous practice was to start early in the morning, in summer, and to finish the day's journey early in the afternoon. Thus we learn from Mrs. Manley's journey that in 1725, during the stage-coach progress from London to Exeter, which occupied four summer days, the passengers were aroused every morning at two o'clock, left their inn at three, dined at ten o'clock, and finished their day's labour at three in the afternoon.

The practice of beginning the day's work at such an early hour was made a subject of complaint by those who objected to stage coaches *in toto*, and in whose eyes nothing connected with them could be right. The expressions of the "Lover of his Country," whose views we have already quoted on other points, refer to a period about fifty years earlier than that of our last extract, but his words illustrate the objection to early rising. He asks, "What advantage

is it to men's health to be called out of their beds into these coaches an hour before day in the morning, to be hurried in them from place to place till one hour, two, or three, within night; insomuch that, after sitting all day in the summer, stifled with heat, and choked with dust, or in the winter time starving or freezing with cold, or choked with filthy fogs, they are often brought into their inns by torchlight, when it is too late to sit up to get a supper, and next morning they are forced into the coach so early that they can get no breakfast?" In case of accident or detention, a night stage seems to have been sometimes run, even at the earlier date, and this grumbler goes on to ask:—"Is it for a man's health to travel with tired jades, to be laid fast in the foul ways, and forced to wade up to the knees in mire, afterwards sit in the cold till teams of horses can be sent to pull the coach out? Is it for their health to travel in rotten coaches, and to have their tackle, or perch, or axletree broken, and then to wait three or four hours, sometimes half-a-day, to have them mended, and then to travel all night to make good their stage?"

The subjection of the traveller to the will of the coachman, or, it might be perhaps more correct to say, to the necessities of the case, are dwelt upon by Fielding, whose pictures of the period are admirable, and who seems to have been especially well qualified to write on all subjects connected with

"the road." "Fielding was well read in stage coaches, country squires, inns, and inns of court," says Johnson; while Richardson's opinion was that "had he not known who Fielding was, he should have taken him for an ostler."

Fielding then, in his *Voyage to Lisbon*, refers to the autocratic conduct of the coachman, to whom, he says, "the subjection of the traveller is absolute, and consists of a perfect resignation both of body and soul to another." "In two particulars only his power is defective,—he cannot press you into his service, and if you enter yourself at one place, on condition of being discharged at a certain time at another, he is obliged to perform his agreement if God permit:—but all the intermediate time you are absolutely under his government; he carries you how he will, when he will, and whither he will, provided it be not too much out of the road; you have nothing to eat or to drink, but what, when, and where he pleases. Nay, you cannot sleep unless he pleases you should, for he will order you sometimes out of your bed at midnight, and hurry you away at a moment's warning; indeed, if you can sleep in his vehicle he cannot help it; nay, indeed, to give him his due, this he is ordinarily disposed to encourage, for the earlier he forces you to rise in the morning, the more time he will give you in the heat of the day, sometimes even six hours at an ale-house, or at

their doors, where he always gives you the same indulgence that he allows himself, and for this he is generally very moderate in his demands. I have known a whole bundle of passengers charged no more than half-a-crown for being suffered to remain quiet at an ale-house door for above a whole hour, and that even in the hottest day in summer." The last touch is admirable, showing that the coachman levied black mail for permission to create the very delays which entitled him to exercise his power of dragging the unfortunate passengers out of bed at the early hours complained of.

Pennant, writing in 1782, dwells on his experiences in youth, giving a brief glimpse of the character of the stage-coach in the early part of that century, with a quiet hit in the end, at the more luxurious habits of the time at which he wrote. He says:—"In March 1739-40, I changed my *Welsh* school for one nearer to the Capital, and travelled in the *Chester* stage; then no despicable vehicle for country gentlemen. The first day, with much labor, we got from *Chester* to *Whitchurch*, twenty miles; the second day, to the *Welsh Harp*; the third, to *Coventry*; the fourth, to *Northampton*; the fifth, to *Dunstable*; and, as a wondrous effort, on the last, to *London* before the commencement of night. The strain and labor of six good horses, sometimes eight, drew us through the sloughs of *Mireden*, and many other places. We were constantly out two hours

before day, and as late at night ; and in the depth of winter proportionably later.

"Families which travelled in their own carriages contracted with *Benson* and Co., and were dragged up in the same number of days by three sets of able horses.

"The single gentlemen, then a hardy race, equipped in jack-boots and trousers up to their middle, rode post through thick and thin, and, guarded against the mire, defied the frequent stumble and fall, arose and pursued their journey with alacrity ; while in these days their enervated posterity sleep away their rapid journeys in easy chaises, fitted for the convenience of the soft inhabitants of Sybaris."

A STAGE COACH AND ITS OCCUPANTS.

From the *Tales of an Antiquary*, published half a century ago, we obtain the following interesting description of a stage coach of the first half of the eighteenth century, its appointments, and the character and behaviour of its occupants. The coach described is illustrated by the engraving at the beginning of this chapter.

"I know not," this antiquary writes, "any of the inventions of man which have undergone a more important change and improvement, than these general vehicles of conveyance, stage coaches. In my own young days, they were not formed of that glossy material

which now reflects the ever-changing scenes as they whirl lightly and rapidly along, but were constructed principally of a dull black leather, thickly studded, by way of ornament, with black broad-headed nails tracing out the panels ; in the upper tier of which were four oval windows, with heavy red wooden frames, and green stuff or leathern curtains. Upon the doors, also, there appeared but little of that gay blazonry which shines upon the numerous *quadrigæ* of the present time ; but there were displayed in large characters the names of the places whence the coach started, and whither it went, stated in quaint and antique language. The vehicles themselves varied in shape. Sometimes they were like a distiller's vat, somewhat flattened, and hung equally balanced between the immense front and back springs ; in other instances they resembled a violoncello-case, which was past all comparison the most fashionable form ; and then they hung in a more genteel posture, namely, inclining on to the back springs, and giving to those who sat within the appearance of a stiff Guy Faux, uneasily seated. The roofs of the coaches, in most cases, rose into a swelling curve, which was sometimes surrounded by a high iron guard ; but which, in the Royal Mails, were formed into large domes, surmounted in the centre by an immense carved and gilt imperial crown. The coachman, and the guard, who always held his carabine ready bent,

or, as we now say, cocked upon his knee, then sat together; not as at present, upon a close, compact, varnished seat, but over a very long and narrow boot, which passed under a large spreading hammer cloth, hanging down on all sides, and finished with a flowing and most luxuriant fringe. Behind the coach was the immense basket stretching far and wide beyond the body, to which it was attached by long iron bars or supports passing beneath it; though even these seemed scarcely equal to the enormous weight with which they were frequently loaded. They were, however, never very great favourites, although their difference of price caused them frequently to be well filled; for, as an ancient Teague observed, 'they got in so long after the coach, that they ought to set out a day sooner, to be there at the same time. Arrah!' continued he, 'can't they give it the two hind wheels, and let it go first?' The wheels of these old carriages were large, massive, ill-formed, and usually of a red colour; and the three horses that were affixed to the whole machine—the foremost of which was helped onward by carrying a huge long-legged elf of a postillion, dressed in a cocked hat, with a large green and gold riding coat—were all so far parted from it by the great length of their traces, that it was with no little difficulty that the poor animals dragged their unwieldy burthen along the road. It groaned, and creaked, and lumbered, at

every fresh tug which they gave it, as a ship, rocking or beating up through a heavy sea, strains all her timbers with a low moaning sound, as she drives over the contending waves.

"With the exception of the basket, which is an invention of comparatively modern science and skill, such were the stage coaches of a former day; conveyances at once solid, safe, slow, wearisome, and devoid of every sort of comfort: vehicles which seemed admirably adapted for robbery, as well from their utter incapacity of speed, as from their heavy construction, and the scattered and defenceless train which they formed. It is not to be wondered at then, when all these things are considered, that our ancestors were so cautious in making long journeys in such very ponderous and dilatory carriages. It seems like a jest now, but scarcely an hundred years have passed away since he was considered as rash and presumptuous who ventured many miles from his home without making his will, charging his executors, calling together his debtors and creditors, arranging all his affairs, and taking leave of his family, as if there was little or no probability of his ever returning to it.

"It was on a dull Monday evening, being the 18th of August 1740, that a coach, or rather a tub set upon wheels, called the 'Ashbourne Dispatch,' came rumb-ling into London down Gray's-Inn Lane, which at that time had not a house farther than Elum

Street, as it was then called, beyond which it continued the road to Highgate, in a wild lane bounded by rude ill-shaped banks, enclosing marshy fields and pieces of water. But we shall commence at an earlier period of the journey, in order that the characters and histories of the travellers may unfold themselves; which shall be done rather by their conversation, than by a plain recital of their various destinations, whether connected or separate.

“‘The Ashbourne Dispatch,’ said the bill of intimation, ‘is a new Posting Coach excellently well provided with relays throughout the whole of the journey; and being drawn by three horses, one of which is ridden by the Post-boy, is much more safe than the Derby Mercury, which hath but two, and no Postillion!’ ’Tis also an entire new Coach, with all the last improvements, and it starteth from the Talbot Inn, nigh unto the Spittle Hill, in the town of Ashbourne, at 4 of the clock in the morning of the Monday in every fourth week; and, God being willing, it getteth into the Bear and Ragged Staff Inn, at the north-west corner of West Southfield, before bed-time on the following Monday night, which is Three days sooner than slow-paced Derby Mercury, and notwithstanding its speed it is perfectly secure! The Ashbourne Dispatch is set forth and run by Giles Hooftrotter, who hath been at great charges to have the same carefully driven, and watched by an armed Guard. The

Coach carrieth but four passengers, and Tickets for places may be had by giving timely notice.’

“Of the four persons who on that day week had seated themselves in this crawling vehicle, three only remained, for the other, a stout Quaker, had parted company at Barnet, and in taking leave of his fellow-travellers he said to them, ‘Verily I am sore aggrieved by having tarried so long in this leathern ark, for it hath marvellously fretted and worn my surtout by its lumbering roll over the road ruts. Fare-yewell, friends, I cannot but pity your further journey, howbeit you will be set down at your inn to-night.’

“The persons who were left to be conveyed to town by the Ashbourne Dispatch were of the following description. The one who occupied the right hand front seat was a short and somewhat stout man, dressed in a handsome full-trimmed suit of black, wearing a smart and well-powdered queue-wig surmounted by a small three-cornered hat which he managed with considerable courtliness of air. There was evidently much of the bearing of an ancient gentleman about him, such as the present generation are acquainted with only in old conversation pictures, or the prints of Lombart, Faithorne, and Burghers. The second person who remained in the coach was a much younger, and evidently not so well-bred a man. His coat, of scarlet and gold lace was

cut in the most extravagant manner of the strange custom of the year 1740, which was in the form of a long narrow frock, that buttoned closely down the front, to the very bottom, and hung some inches below the knees, while the pocket-holes formed horizontal lines a little way above. The sleeves were then made short, to exhibit the fine quality of the Holland shirt, for which purpose also the waistcoat was sometimes left unbuttoned, and the linen tastefully brought through the aperture. A wig of white wool, slightly spreading over the shoulders, and covered by a broad-brimmed hat of brown beaver, was placed upon the head of our second traveller, a small rapier stuck out between the skirts of his coat behind, and on his feet were the high red-heeled shoes of full dress, the quarters of which reached the ankle-bone, while their fronts stretched up the top of the foot, adorned with a large crimson rosette. Slung over the immense cuff of his coat, which nearly reached his elbow, the young gallant carried a clouded amber cane, and he occasionally drew out and flourished a fringed cambric handkerchief. His manners coincided with his dress, for they were light and varying; sometimes he would be reciting in the mouthing manner of his period, at other times singing, and interspersing his idle converse with ludicrous tales, quaint remarks, or other strange fancies, but keeping throughout all the most perfect hilarity and good humour.

"The third person who was left in the Ashbourne Dispatch was a young country female. There was sorrow and thought upon her face, and she had spoken but little during the journey, excepting to return her thanks for the benevolent attentions paid to her by the elder gentleman in the black suit; or those which were more awkwardly shewn her by the stout Quaker. For her dress, it was of a coarse light brown stuff, with a long pointed stomacher, guarded and laced with blue; her linen was of a beautiful whiteness, and a large and flat straw hat covered her head. The circumstance of such a person travelling in 1740 in a Stage and not in a Waggon was calculated to procure for her a respect which would not have been commanded by her dress.

"By the time the Ashbourne Dispatch had rolled into the lower end of Gray's Inn Lane, the dulness of a hot summer's evening was spreading itself over the streets of the metropolis.

"'Well, here we are at last in that receptacle for all that's good and bad, London,' cried Cleartext, 'and even now you may hear the signs of Holborn creaking as they swing upon their irons in the sluggish breeze of an August evening. Marry, sir, you should visit the town when a high March wind is scattering the ill-placed tiles over the short roofs of this brick Babylon; and the signs drive eastward and westward as the gale takes them. Then you may see the Turk's Head go to

cuffs with the Cardinal's Hat, the Lamb runs bolt against the Lion Rampant, the Star sticks its spikes between the horns of the New Moon; and it's 'fight dog, fight bear, from the one end of the town to the other. Halloo, coach-man,' continued he, thrusting his head out of the coach-window, 'don't carry us to your infernal Bear and Ragged Staff, but stop at Furnival's Inn gate. There, draw up your cavalcade; so, well done.'"

The *Spectator* furnishes us with just one glimpse of stage-coach company in the early years of the eighteenth century:—

"Having notified to my good friend Sir Roger that I should set out for London the next day, his horses were ready at the appointed hour in the evening, and, attended by one of his grooms, I arrived at the county town at twilight, in order to be ready for the stage-coach the day following. As soon as we arrived at the inn, the servant who waited upon me inquired of the chambermaid in my hearing what company he had for the coach? The fellow answered, Mrs. Betty Arable, the great fortune, and the widow her mother, a recruiting officer (who took a place because they were to go), young Squire Quickset, her cousin

(that her mother wished her to be married to), Ephraim the Quaker, her guardian, and a gentleman who had studied himself dumb from Sir Roger de Coverley. . . . The next morning at daybreak we were all called, and I, who know my own natural shyness and endeavour to be as little disputed with as possible, dressed immediately that I might make no one wait. The first preparation for our setting out was that the captain's half-pike was placed near the coachman, and a drum behind the coach. In the meantime the drummer, the captain's equipage, was very loud that none of the captain's things should be placed so as to be spoiled; upon which his cloak-bag was fixed in the seat of the coach, and the captain himself, according to a frequent, though invidious behaviour of military men, ordered his man to look sharp that none but one of the ladies should have the place he had taken fronting to the coach-box.

"We were in some little time fixed in our seats, and sat with that dislike which people not too good-natured usually conceive of each other at first sight. The coach jumbled us insensibly into some sort of familiarity."



CHAPTER II.

Thou dost bear no grudge
To whisking tilburies, or phaetons rare,
Curricles or mail coaches, swift beyond compare.—KEATS.

FLYING COACHES—THE EDINBURGH "GLASS COACH"—INCIDENTS OF STAGE-COACH TRAVEL—DANGERS OF OUTSIDE TRAVELLING—THE "HAWES FLY"—THE DERBY DILLY—RIDING "BODKIN"—THE STAGE COACH A MICROCOSM—LOVE IN A STAGE COACH—STAGE-COACH DANGERS—HIGHWAYMEN—SHOT-PROOF COACHES—A FRENCH STAGE COACH—VEHICLES IN SPAIN.

FLYING COACHES.

ABOUT the middle of last century the improvement of the roads, or the increasing demands of the mercantile community, or a combination of the two, led to a demand for improvement in the rate at which stage coaches travelled, and to the introduction of the "Flying coaches," so called because their speed was beyond the three miles an hour which up till that time was the standard. The first illustration of the better coaches is probably that of the Birmingham and London coach in 1742, of which the announcement was as follows:—"The Litchfield and Birmingham stage coach sets out this morning (Monday) from the 'Rose Inn' at Holbourn Bridge, London, and will be at the house of Mr. Francis Cox, the 'Angel and Hen and Chickens' in the High Town, Birmingham, on Wednesday next

to dinner, and goes the same afternoon to Litchfield, and returns to Birmingham on Thursday morning to breakfast, and gets to London on Saturday night, and so will continue every week regularly with a good coach and able horses."

A bill of the "Alton and Farnham Machine," dated 1750, is headed with an engraving of the coach, which has a large basket swung behind for outside travellers, the carriage having a rounded top as described in last chapter. The coachman has four horses in hand, and a postillion rides one of a pair of leaders.

It accomplished a journey of forty-seven miles in one day, starting at six in the morning and reaching its destination the same night. This was deemed a great feat, and this coach was dignified with the title of "Machine." The name soon became common, and

hence stage coach horses were called "machiners."

One of the earliest notices of stage coaches in Scotland is found in the *Scots Magazine* for 1749. A stage coach between Edinburgh and Glasgow was set up in that year, leaving Edinburgh every Monday and Thursday, and Glasgow every Tuesday and Friday. Each person paid 9s., and was allowed a "stone weight of baggage." The first coach ran on 24th April. In May of the same year an "Edinburgh and Corstorphine Stage Chaise" was set up, running eight or nine times a week and four times on Sunday. The fare was 6d., which is less than the fare now charged by an omnibus still running on the same stage.

THE EDINBURGH GLASS COACH.

The following advertisement appeared in the *Edinburgh Evening Courant* for July 1st, 1754. It was surmounted by a woodcut corresponding with that of the Alton and Farnham Machine, and representing the stage coach as a towering vehicle, protruding at top. The coachman is a stiff-looking antique little figure who holds the reins with both hands, as if he were afraid of the horses running away, and a long whip streams over his head and over the top of the coach, falling down behind. There are six horses, "like starved rats in appearance," says Chambers, and a postillion upon one of the leaders with a whip :—

"The Edinburgh Stage Coach,

for the better accommodation of Passengers, will be altered to a genteel two-end Glass Machine, hung on Steel Springs, exceeding light and easy, to go in ten days in summer and twelve in winter; to set out the first Tuesday in March and continue it from Hosea Eastgate's, the *Coach and Horses* in Dean Street, Soho, London, and from John Somerville's in the Canongate, Edinburgh, every other Tuesday, and meet at Burrow Bridge on Saturday night, and set out from thence on Monday morning, and get to London and Edinburgh on Friday. In the winter to set out from London and Edinburgh every other Monday morning, and to go to Burrow Bridge on Saturday night, and to set out from thence on Monday morning, and get to London and Edinburgh on Saturday night. Passengers pay as usual. Performed, if God permits, by your dutiful servant,

"HOSEA EASTGATE.

"Care is taken of small parcels according to their value."

The merchants of Manchester in 1754 started a "Flying Coach," of which the advertisement said that "incredible as it may appear, this coach will actually (barring accidents) arrive in London in four days and a half after leaving Manchester." In 1757, Liverpool followed suit with a coach for which even greater speed was claimed. This "flying machine on steel springs," which was designed to eclipse the Manchester

coach, occupied only three days between the cities. Other towns, such as Sheffield and Leeds, also established flying coaches, so that there was a general preparedness for the great revolution which Mr. Palmer accomplished by the introduction of the mail-coach system in 1784.

It was of such vehicles that John Woolmer, a famous leader amongst the American Quakers, wrote on his visit to England in 1772. From a memoir recently published, we learn that "his quietism was shocked by the hurry of stage coaches," which frequently went *upwards of one hundred miles in twenty-four hours*. The horses, he alleged, were "killed by hard driving," and the post-boys were frozen to death on winter nights. "So great," says this placid Friend, "is the hurry in the spirit of this world, that in aiming to do business quick to gain wealth the creation at this day doth loudly groan." If he said this of four miles an hour, what would he have said, had he lived a century later, of fifty or sixty miles an hour? Improvement in speed alone was not all that was attempted, as may be judged from a contemporary description of a remarkable carriage which set out from Aldersgate Street, for Birmingham, in 1758, from which town it had arrived the Thursday before full of passengers and baggage. This coach was represented as going without using coomb, or any oily, unctuous, or other liquid matter whatever to the wheels or axles; its construction

being such as to render all such helps useless. The inventor, we are told, had engraved on the boxes of the wheels, these words, FRICTION ANNIHILATED, and it was asserted that the carriage would go as long and as easy, if not longer and easier, without greasing, than any of the ordinary stage carriages will do with greasing. The recorder of the incident, in the *Annual Register* for 1758, says:—"If this answers in common practice it is perhaps the most useful invention in mechanics that this age has produced." We have not traced the subsequent career of the friction-annihilator, which doubtless proved, like many other most useful inventions, not to be so successful as either its inventor or its chronicler believed.

INCIDENTS OF STAGE-COACH TRAVEL.

Some of the incidents of the now reputed "flying" coaches are amusing in their nature. Of course the highwayman appeared frequently on the scene, but some of his exploits will be illustrated farther on. There were often tipsy drivers, and the following instance from the *Remains of T. W. Hill* may suffice as an illustration, with its interesting record of kindness to the "unprotected female" and her boy:—"A little boy going to school and his mother are the only passengers in one stage-coach from Worcester to Gloucester. The coach rolls about, and a horseman is seen speaking

to the coachman, who at last is ordered to stop. It is not a robber, but a neighbouring farmer, who opening the carriage door, says the driver is so drunk that there will probably be an accident, and after conducting the two passengers to his farm near by, afterwards carries them on a pillion to Gloucester."

Overloading was another evil, regarding which the compiler of the *Annual Register* for 1770 says, "It were greatly to be wished that stage coaches were put under some regulation as to the number of persons and quantity of luggage carried by them. Thirty-four persons were in and about the Hertford coach this day, which broke down by one of the braces giving way. One of the outside passengers (a fellmonger in the Borough) was killed upon the spot, a woman had both her legs broke, another had one leg broke, and very few of the number either within or without but were severely bruised."

DANGERS OF OUTSIDE TRAVELLING.

The high speed was made the subject of most frequent marvel, the "danger" to the outside passengers in travelling through the air at rather less than the walking pace of Payson Weston, the pedestrian of our own day, being frequently adverted to.

The danger of travelling on the outside arose from the circumstance that there was, at first, no

direct provision for outside passengers in the form of regular seats or benches. But the pleasure of the outside, on which something more shall be said when the more fully-equipped mail coaches of a later period come to be described, was recognised at an early time by travellers. Charles P. Moritz, a Lutheran clergyman from Prussia, who visited England in 1782; wrote a most interesting narrative, which is given by Pinkerton, and from which a quotation was made in a previous chapter. He says on this subject—"They have here a curious way of riding, not in, but upon, a stage coach. . . He who can properly balance himself rides not incommodiously on the outside; and in summer time, in fine weather, on account of the prospects, it certainly is more pleasant than it is within; excepting that the company is generally low, and the dust is likewise more troublesome than in the inside, where, at any rate, you may draw up the windows according to your pleasure."

Most of Mr. Moritz's seven weeks' journey through England was made on foot, but being pressed for time on his return to London, he determined to take the stage for part of the way; and this portion of his travel is so curious a picture of the delights of outside travelling a century ago, that it deserves to be quoted in full:—

"This ride," says he, "from Leicester to Northampton, I shall remember as long as I live.

"The coach drove from the yard through a part of the house. The inside passengers got in in the yard, but we outside were obliged to clamber up on the public street, because we should have had no room for our heads to pass under the gateway.

"My companions on the top of the coach were, a farmer, a young man very decently dressed, and a blackamoor.

"The getting up alone was at the risk of one's life, and when I was up I was obliged to sit just at the corner of the coach, with nothing to hold by but a sort of little handle fastened on the side. I sat nearest the wheel, and the moment we set off I fancied I saw certain death await me. All I could do was to take still firmer hold of the handle, and to be more and more careful to preserve my balance.

"The machine now rolled along with prodigious rapidity over the stones through the town, and every moment we seemed to fly into the air, so that it was almost a miracle that we still stuck to the coach and did not fall. We seemed to be thus on the wing, and to fly as often as we passed through a valley, or went down a hill.

"At last the being continually in fear of my life became insupportable, and as we were going up a hill, and consequently proceeding rather slower than usual, I crept from the top of the coach, and got snug into the basket.

"O sir, sir, you will be shaken to death!" said the black, but I

flattered myself he exaggerated the unpleasantness of my post.

"As long as we went up hill it was easy and pleasant; and having had little or no sleep the night before, I was almost asleep among the trunks and packages; but how was the case altered when we came to go down hill! then all the trunks and packages began, as it were, to dance around me, and everything in the basket seemed to be alive, and I every moment received from them such violent blows that I thought my last hour was come. I now found that what the black had told me was no exaggeration, but all my complaints were useless. I was obliged to suffer this torture nearly an hour, till we came to another hill, when, quite shaken to pieces and badly bruised, I again crept to the top of the coach and took my former seat: 'Ah! did I not tell you you would be shaken to death?' said the black as I was getting up, but I made him no reply. Indeed I was ashamed, and I now write this as a warning to all strangers who may happen to take it into their heads, without being used to it, to take a place on the outside of an English post-coach, and still more a place in the basket."

As regards one section of the journey, his experience was peculiarly disagreeable: "From Harborough to Leicester I had a most dreadful journey, it rained incessantly; and as before we had been covered with dust, we now were soaked with rain. My neighbour,

the young man who sat next me in the middle, that my inconveniences might be complete, every now and then fell asleep, and as, when asleep, he perpetually bolted and rolled against me with the whole weight of his body, more than once he was very near pushing me entirely off my seat."

The speed referred to may be gauged from words put into the mouth of one of his characters by John Galt, in *Annals of the Parish*. He says, "At seven o'clock we got into the fly-coach for the capital of Scotland, which we reached, after a heavy journey, about the same hour in the evening." The journey from Glasgow to Edinburgh by coach thus occupying in 1770 about twelve hours, or at the rate of three and a half miles an hour.

That the discomforts of the "basket" were not exaggerated, so long as it was a veritable basket, and not, as in later times, a portion of the vehicle (like the *rotonde* of the foreign diligence), may be judged from a remark by the Dean of St. Paul's, who, contrasting the condition of travellers in his youth with the facilities open to him when he could speak of himself as aged 73, says: "As the basket of stage coaches, in which luggage was then carried, had no springs, your clothes were all rubbed to pieces." In one of Sydney Smith's remarks, which will be found in his letters on *Locking in on Railways*, Herr Moritz would scarcely have concurred:—

"When first mail coaches began to travel twelve miles an hour, the *outsides* (if I remember rightly) were never tied to the roof." Even at five or six miles an hour, if the German's description is correct, the state of the roads would have made the tying on of outside passengers a benefit. But Sydney Smith was writing of a period with better roads, when twelve miles an hour became possible, not of that still earlier time of which he says: "It took me nine hours to go from Taunton to Bath before the invention of railroads. . . . In going from Taunton to Bath, I suffered from 10,000 to 12,000 severe contusions, before stone-breaking Macadam was born."

THE "HAWES FLY."

Scott, in the first chapter of the *Antiquary*, has given an admirable sketch of the condition of the stage coaches running from Edinburgh to South Queensferry, at a period vaguely stated as being "near the end of the eighteenth century." The account of the coach, the coach office, and the passengers, is as follows:—

"The coach was calculated to carry six regular passengers, besides such interlopers as the coachman could pick up by the way, and intrude upon those who were legally in possession. The tickets which conferred a right to a seat in this vehicle of little ease were dispensed by a sharp-looking old dame, with a pair of spectacles

on a very thin nose, who inhabited a "laigh shop," *Anglicé*, a cellar, opening to the High Street by a strait and steep stair, at the bottom of which she sold tape, thread, needles, skeans of worsted, coarse linen cloth, and such feminine gear, to those who had the courage and skill to descend to the profundity of her dwelling without falling headlong themselves, or throwing down any of the numerous articles which, piled on each side of the descent, indicated the profession of the trader below.

"The written hand-bill, which, pasted on a projecting board, announced that the Queensferry Diligence, or Hawes Fly, departed precisely at twelve o'clock on Tuesday, the fifteenth July, 17—, in order to secure for travellers the opportunity of passing the Firth with the flood-tide, lied on the present occasion like a bulletin; for although that hour was pealed from St. Giles' steeple, and repeated by the Tron, no coach appeared on the appointed stand. It is true only two tickets had been taken out, and possibly the lady of the subterranean mansion might have an understanding with her Automedon that in such cases a little space was to be allowed for the chance of filling up the vacant places,—or the said Automedon might have been attending a funeral and be delayed by the necessity of stripping his vehicle of its lugubrious trappings, or he might have stayed to take a half-mutchkin extra-

ordinary with his crony the hostler—or—in short he did not make his appearance." . . .

After describing the two passengers—well known to the world as Mr. Lovel and "Monkbarns,"—Sir Walter Scott gives us the following picturesque description of the combat between the latter and the redoubtable Mrs. Macleuchar:—

" 'We have taken places, ma'am,' said the younger stranger, 'in your diligence for Queensferry'—"

" 'Which should have been half-way on the road before now,' continued the elder and more impatient traveller, rising in wrath as he spoke; 'and now in all likelihood we shall miss the tide, and I have business of importance on the other side—and your cursed coach'—"

" 'The coach?—Gude guide us, gentlemen, is it no on the stand yet?' answered the old lady, her shrill tone of expostulation sinking into a kind of apologetic whine. 'Is it the coach ye hae been waiting for?'

" 'What else could have kept us broiling in the sun by the side of the gutter here, you—you faithless woman, eh?'

"Mrs. Macleuchar now ascended her trap stair (for such it might be called, though constructed of stone), until her nose came upon a level with the pavement; then, after wiping her spectacles to look for that which she well knew was not to be found, she exclaimed, with well-feigned astonishment, 'Gude guide us!—saw ever onybody the like o' that?'

“‘Yes, you abominable woman,’ vociferated the traveller, ‘many have seen the like of it, and all will see the like of it, that have anything to do with your trolloping sex;’ then, pacing with great indignation before the door of the shop, still as he passed and re-passed, like a vessel who gives her broadside as she comes abreast of a hostile fortress, he shot down complaints, threats, and reproaches, on the embarrassed Mrs. Macleuchar. He would take a post-chaise—he would call a hackney-coach—he would take four horses—he must—he would be on the north side to-day—and all the expense of his journey, besides damages, direct and consequential, arising from delay, should be accumulated on the devoted head of Mrs. Macleuchar.

“There was something so comic in his pettish resentment, that the younger traveller, who was in no such pressing hurry to depart, could not help being amused with it, especially as it was obvious, that every now and then the old gentleman, though very angry, could not help laughing at his own vehemence. But when Mrs. Macleuchar began also to join in the laughter, he quickly put a stop to her ill-timed merriment.

“‘Woman,’ said he, ‘is that advertisement thine?’ showing a bit of crumpled printed paper: ‘Does it not set forth, that, God willing, as you hypocritically express it, the Hawes Fly, or Queensferry Diligence, would set forth to-day at twelve o’clock?’

and is it not, thou falsest of creatures, now a quarter past twelve, and no such fly or diligence to be seen?—Dost thou know the consequence of seducing the lieges by false reports?—dost thou know it might be brought under the statute of leasing-making? Answer—and for once in thy long, useless, and evil life, let it be in the words of truth and sincerity,—hast thou such a coach?—is it *in rerum natura*?—or is this base annunciation a mere swindle on the incautious, to beguile them of their time, their patience, and three shillings of sterling money of this realm?—Hast thou, I say, such a coach? ay or no?’

“‘O dear, yes, sir; the neighbours ken the diligence weel, green picked out wi’ red—three yellow wheels and a black ane.’

“‘Woman, thy special description will not serve—it may be only a lie with a circumstance.’

“‘O man! man!’ said the overwhelmed Mrs. Macleuchar, totally exhausted at having been so long the butt of his rhetoric, ‘take back your three shillings, and mak me quit o’ ye.’

“‘Not so fast, not so fast, woman—Will three shillings transport me to Queensferry, agreeably to thy treacherous programme?—or will it requite the damage I may sustain by leaving my business undone?—or repay the expenses which I must disburse if I am obliged to tarry a day at the South Ferry for lack of tide?—Will it hire, I say, a

pinnaee, for which alone the regular price is five shillings?’

“Here his argument was cut short by a lumbering noise, which proved to be the advance of the expected vehicle, pressing forward with all the despatch to which the broken-winded jades that drew it could possibly be urged. With ineffable pleasure, Mrs. Macleuchar saw her tormentor deposited in the leathern convenience; but still, as it was driving off, his head thrust out of the window reminded her, in words drowned amid the rumbling of the wheels, that, if the diligence did not attain the Ferry in time to save the flood-tide, she, Mrs. Macleuchar, should be held responsible for all the consequences that might ensue.

“The coach had continued in motion for a mile or two before the stranger had completely repossessed himself of his equanimity, as was manifested by the doleful ejaculations, which he made from time to time, on the too great probability, or even certainty, of their missing the flood-tide. By degrees, however, his wrath subsided; he wiped his brows, relaxed his frown, and, undoing the parcel in his hand, produced his folio, on which he gazed from time to time with the knowing look of an amateur, admiring its height and condition, and ascertaining, by a minute and individual inspection of each leaf, that the volume was uninjured and entire from title-page to colophon. . . .

“Although two causes of delay

occurred, each of much more serious duration than that which had drawn down his wrath upon the unlucky Mrs. Macleuchar, our ANTIQUARY only bestowed on the delay the honour of a few episodical pools and pshawes, which rather seemed to regard the interruption of his disquisition than the retardation of his journey. The first of these stops was occasioned by the breaking of a spring, which half an hour’s labour hardly repaired. To the second, the Antiquary was himself accessory, if not the principal cause of it; for, observing that one of the horses had cast a fore-foot shoe, he apprised the coachman of this important deficiency. ‘It’s Jamie Martingale that furnishes the naigs on contract, and uphauds them,’ answered John, ‘and I am not entitled to make any stop, or to suffer prejudice by the like of these accidents.’

“‘And when you go to—I mean to the place you deserve to go to, you scoundrel,—who do you think will uphold *you* on contract? If you don’t stop directly and carry the poor brute to the next smithy, I’ll have you punished, if there’s a justice of peace in Mid-Lothian;’ and opening the coach door, out he jumped, while the coachman obeyed his orders, muttering, that ‘if the gentlemen lost the tide now, they could not say but it was their ain fault, since he was willing to get on.’

“So much time was consumed by these interruptions of their journey, that when they descended

the hill above the Hawes (for so the inn on the southern side of the Queensferry is denominated), the experienced eye of the Anti-quary at once discerned, from the extent of wet sand, and the number of black stones and rocks, covered with sea-weed, which were visible along the skirts of the shore, that the hour of tide was past. The young traveller expected a burst of indignation; but whether, as Croaker says in 'The Good-natured Man,' our hero had exhausted himself in fretting away his misfortunes beforehand, so that he did not feel them when they actually arrived, or whether he found the company in which he was placed too congenial to lead him to repine at anything which delayed his journey, it is certain that he submitted to his lot with much resignation.

"The d—I's in the diligence and the old hag it belongs to!—Diligence, quoth I? Thou shouldst have called it the Sloth—Fly, quoth she? why, it moves like a fly through a glue-pot as the Irishman says. But, however, time and tide tarry for no man; and so, my young friend, we'll have a snack here at the Hawes, which is a very decent sort of a place; and I'll be very happy to finish the account I was giving you of the difference between the mode of entrenching *castra stativa* and *castra æstiva*, things confounded by too many of our historians. Lack-a-day, if they had ta'en the pains to satisfy their own eyes, instead of following each other's blind guidance!

—Well! we shall be pretty comfortable at the Hawes; and besides after all, we must have dined somewhere, and it will be pleasanter sailing with the ebb of tide and the evening breeze.'

"In this Christian temper of making the best of all occurrences, our travellers alighted at the Hawes."

THE DERBY DILLY—RIDING "BODKIN."

The former classic Fly was designed for six inside, namely three on each seat, and Scott suggests as a probable cause of the delay only in starting, the fact that two places had been engaged. The reference to six insides brings to notice the practice of riding "bodkin"—no very comfortable seat, when Herr Moritz's vivid picture of the jolting of the badly-hung carriage is taken into account. In the "mail coaches" subsequently introduced, the complement was four inside, so that each passenger got a corner, and had for his support one of those looped bands which, curiously enough, were continued for many years as part of the fittings of our first-class railway carriages, when the jolting that made them necessary had, or should have disappeared. The comforts of "bodkin" are commemorated in the well-known lines, from the "Loves of the Triangles," in Canning's *Anti-Jacobin*, 23d April 1798:—

So down thy hill, romantic Ashbourne,
glides,
The Derby dilly, carrying three insides;

One in each corner sits and lolls at ease,
 With folded arms, propt back, and
 outstretched knees ;
 While the press'd *Bodkin*, punched and
 squeezed to death,
 Sweats in the midmost place, and
 scolds and pants for breath.

The pleasure or dignity of a seat in the inside was not, it will be seen, wholly without drawback, the complaint being chiefly in the direction of overcrowding, or rather, as the writer of the *Loves of the Triangles* indicates, that the method of putting three in a seat was not a comfortable one. Our Prussian visitor, Pastor Moritz, while fairly balancing the advantages of outside and inside, was able, though much enamoured of the latter, to indicate this inconvenience. He says in one chapter, speaking of his first experience of an English stage coach :—" Yesterday afternoon I had the luxury for the first time of being driven in an English stage. These coaches are, at least in the eyes of a foreigner, quite elegant, lined in the inside, and with two seats large enough to accommodate six persons. But it must be owned, when the carriage is full, the company are rather crowded." At a period somewhat earlier, as we learn from paragraphs in the *Annual Register*, the stage coaches were in some instances designed to carry eight inside, and it is probably to such a vehicle that Fielding refers in a sketch he gives, in *Tom Jones*, of the packing of passengers in the stage coach as contrasted with the comfort of the private carriage :—

" And now a matter of some

difficulty arose ; and this was, how his lordship himself should be conveyed : for though in stage coaches, where passengers are properly considered as so much luggage, the ingenious coachman stows half a dozen with perfect ease into the place of four,—for well he contrives that the fat hostess or well-fed alderman may take up no more room than the slim miss or taper master ; it being the nature of guts, when well squeezed, to give way, and to lie in a narrow compass,—yet in these vehicles, which are called, for distinction sake, gentlemen's coaches, though they are often larger than the others, this method of packing is never attempted."

THE STAGE COACH A MICROCOSM.

Numerous writers have left us evidence how largely the stage coach proved a theatre upon which human nature exhibited itself in various aspects for the study of individual or national character. A leading feature in the pictures of character thus obtained seems to have been the persistency with which the snobs of the period sought to enhance their dignity in the eyes of fellow-passengers by asserting how little accustomed they were to such a common mode of travelling. We have an instance of this pretty early in the seventeenth century, in Sir Robert Howard's comedy, called *The Committee*, which describes with apparent exactness the manners of the times immediately preceding

the death of Charles the First. In the opening scene, the characters arrive in London by the Reading stage coach. That this was not one of the caravans or any undignified vehicle is apparent, from the language used by the Committee-man's wife, a very ostentatious personage, who, though she thinks it necessary to apologise for riding in a stage coach, "her own being in disorder," makes a boast of her having done so in company with the Mayor and Mayoress of Reading. From other passages in the play it appears that the coach carried six inside passengers, and the gratuity which this lady thinks proper to give the coachman for the care of herself and two of her family, is, as the coachman describes it, "a groat of more than ordinary thinness," a remark which he accompanies with a sneer at the liberality of the "new gentry" of those days. An essayist of last century (*The World*, No. 48) presents us with a similar picture :—

"When I am inclined to make an excursion into the country, I either travel on foot, or if the distance or the weather should make it necessary, I take my place in that social and communicative vehicle called a stage coach. Happy is the man who, without any laboured designs of his own, finds his very wants to be productive to his conveniences ! This man am I ; having met with certain characters and adventures upon these rambles that have contributed more to the enriching

my stock of hints towards carrying out this work, than would ever have presented themselves had I drove along the road admiring the splendour of my own equipage, or lolled at my ease in the hired one of another." The writer goes on to ask, "Who is there that has travelled in a stage coach, but must have heard it observed by the most ordinary of the passengers, that this was the first time in their lives that they had ever suffered themselves to be crowded into so mean a carriage ? I have always remarked that within half a dozen miles of the end of our journey, if there has been a fine-spoken lady in the coach, though but a country shopkeeper's wife who imagined herself a stranger to the company, she has expressed great anger and astonishment at not seeing the chaise, the chariot, or the coach coming to meet her on the road."

A century later, we find a similar observation in Ramée's *Histoire des Voitures*, where, speaking of a curious class of vehicles not now existing, but which ran between Paris and the surrounding towns, it is said :—"We should be truly ungrateful towards the memory of the *coucou* if we did not recall that the little journey we made in it was filled with amusing and often grotesque episodes, because of the burlesque circumstances which spring up in a crowd during the voyage. The conversations of the different classes of passengers was almost always very diverting."

LOVE IN A STAGE COACH.

That the interior of a stage coach may be turned to more agreeable purposes than the study of human nature, or listening to diverting talk, is shown by an incident in the life of Mrs. Maclehose (Burns's *Clarinda*) whose courtship in 1774 is thus described. "Mr. James Maclehose, a young gentleman of respectable connections, and a law-agent in Glasgow, had been disappointed in not obtaining an introduction to Miss Agnes Craig, one of the beauties of Glasgow, and destined a few years afterwards to attain to undying fame as 'Clarinda' the correspondent of Burns. When Maclehose learned that she was going to Edinburgh, he engaged all the seats in the stage coach, excepting the one taken for her. At that period the coach took the whole day to perform the journey between the two cities, stopping a considerable time for dinner on the road, which thus afforded Mr. Maclehose an excellent opportunity of making himself agreeable, an opportunity which he took the utmost pains to improve, and with success, being possessed of an agreeable and attractive person and most insinuating manners."

The benefits of personal intercourse between different classes of the community may be mentioned as another of the merits with which stage-coach travelling may be credited. On this subject much might be written, perhaps as applicable to all modern travelling

appliances as to that of public coaches. But here this characteristic of travel first prevented itself, and its benefits have thus been chronicled by Leigh Hunt, in his essay on *Coaches and their Horses* :—

"The stage coach is a very great and unpretending accommodation. It is a cheap substitute, notwithstanding its eighteenpenny and two-and-sixpenny temptations, for keeping a carriage or a horse ; and we really think, in spite of its gossiping, is no mean help to village liberality ; for its passengers are so mixed, so often varied, so little yet so much together, so compelled to accommodate, so willing to pass a short time pleasantly, and so liable to the criticism of strangers, that it is hard if they do not get a habit of speaking, or even thinking, more kindly of one another than if they mingled less often, or under other circumstances. The old and infirm are treated with reverence ; the ailing sympathised with ; the healthy congratulated ; the rich not distinguished ; the poor well met, the young, with their faces conscious of ride, patronised and allowed to be extra. Even the fiery, nay, the fat, learn to bear with each other, and if some high-thoughted persons will talk now and then of their great acquaintances, or their preference of a carriage, there is an instinct which tells the rest that they would not make such appeals to their good opinion if they valued it so little as might be supposed."

STAGE-COACH DANGERS.

The world has been tantalised by the loss of what might have proved a graphic description of one form of the dangers of travelling from the pen of one of the wits of the *Anti-Jacobin*. In the canto of the (imaginary) poem, the *Loves of the Triangles*, from which the lines on the Derby Dilly are taken, the "argument" contains these words:—"Catastrophe of Mr. Gingham, with his wife and three daughters, overturned in a one-horse chaise—Dislocation and Contusion two kindred Fiends—Mail Coaches—Exhortation to Drivers to be careful." The racy account for which readers were thus prepared, and which for this book would have been most valuable, was never given, and the so-called "extracts" in a future number of the *Anti-Jacobin* begin farther on, stating that the rest are omitted as "containing expressions of too free a nature!"

The following narrative of an accident in 1799 gives in truth, what Mr. Gingham's adventures pointed to in jest:—"Of all the deplorable cases which too frequently happen by the carelessness of stage-coach drivers, the loss of Arthur Robinson, Esq., of Duke Street, St. James's, his wife, and their female servant, returning from a six weeks' tour on a visit to their friends, in the Balloon coach from Liverpool to Birmingham, is the most truly afflicting. The Trent having been unusually swelled by the late incessant rains,

the coach was unfortunately overturned as it was passing Tittensor. There were six inside and three outside passengers, besides two coachmen; the regular driver being ill on the roof, when the coach fell, and his having to trust the reins to another is supposed to have been one principal cause of the melancholy event. The other passengers, consisting of two naval officers and a respectable gentleman of Liverpool, extricated themselves, and were fortunately saved, though with great difficulty; and those on the outside also happily escaped. The body of Mrs. Robinson was taken out of the coach about a quarter of an hour after the accident, and that of the servant was found soon after; but the remains of Mr. R. were not discovered till the following evening, having floated down with the torrent." This accident occurred near Stone, in Staffordshire, about eight o'clock in the morning. In another account of the same accident it is stated that one of the passengers spoke to the driver to keep farther off, and on the wheel touching one of the posts he was sharply remonstrated with, but replied "there was no more danger than on a floor." In about a minute after, the edge of the bank gave way under the fore-wheel, and the coach, horses, and passengers, fell instantly over into the river. The sequel to the incident reads like a familiar scene in Hamlet. "The maid servant floated down the stream, and might have been saved had the other

passengers had the presence of mind to hold out a stick to her, as she was found about half an hour afterwards hanging by a branch of a willow which she caught with her hand, but was then quite dead."

HIGHWAYMEN.

The occasions were numerous when the patrons of the stage coach had to encounter

Crape and cocked pistol, [and the whistling ball
Sent through the traveller's temples.

and the incidents greatly resembled in their details the illustrations of highway robbery given in a previous section of this work. Our earliest instance is somewhat of a wholesale character, and aptly illustrates the utter lawlessness of the road which prevailed down to a much later date. "It is incontestible," says the learned editor of the *Museum of Science and Art*, "that travelling over land was formerly regarded with greater apprehension of danger than at present. A century has not elapsed since no prudent person would start upon a journey, say from Exeter to London, without a solemn farewell of his kindred, and the deposition of his last will and testament in trustworthy hands;" and while admitting that the improvement in the art of locomotion has made us familiar with 'incidents (accidents) which assuredly had no parallel in the days of waggons and stage coaches, he asks, "Is the

traveller of fifty miles an hour by steam, on railway, in the nineteenth century, really exposed to greater risks, and does he really need the prayers of the Church more urgently than the wayfarer in the beginning of the eighteenth?" We may doubt whether the question should be answered in the affirmative when we read that "in one week in 1720 all the stage coaches coming from Surrey to London were robbed by highwaymen, and a gang of highwaymen robbed all the passengers on the Croydon Road for some hours together." In the same week a gentleman in his coach was robbed near Chelsea, another was attacked and robbed at twelve at night at the upper end of Cheapside, and several robberies were committed on the Epping Road. The robbery was not always attended with injury to the passenger, the tables being turned upon the robber, as in the case of a highwayman who was "shot dead by a person in the Portsmouth machine whilst he was attempting to rob the passengers." The reality of the perils from robbers created fears that were sometimes ill founded, and such an untoward incident as that narrated in the *Annual Register* for 1774, and which was fatal to an innocent man whom the stage-coach passengers chose to suspect of evil intent, illustrates a danger to the wayfarer to which the railway era can probably furnish no parallel:—

"A poor fellow was shot dead

by the guard of the Exeter coach on suspicion of his being a highwayman ; but, on examination they could find no firearms, or powder, or ball, about him, nor any money in his pocket. He had only a pair of gloves, an apple, and a watch, in his pockets. His horse had saddle-bags, in which they found only two clean shirts and one dirty one, three neckcloths, and three pairs of stockings, one of silk, and five or six bundles of hair, which appeared to have been just cut from different people's heads, as it was unsorted and uncurled. Before the coroner's inquest it appeared that he was an hair-dresser in King Street, Westminster ; and it is said, that being much in liquor, and having first got entangled among the coach horses, he afterwards, rode round the coach, calling out to the driver to stop ; upon which, the guard, without attending properly to his condition, too hastily and unfortunately fired."

The subject of highwaymen and their misdeeds would almost appear to have engrossed conversation not only inside the coaches but elsewhere, as we have illustrated in the detailed classification of the various kinds of robbers which Pastor Moritz picked up in the course of his sojourn of a few weeks. This traveller's own experience furnished an instance in proof, as in his first stage-coach journey he encountered an incident which he thus describes :—

"The man who was with us in

the coach pointed out to us the country seats of the lords and great people by which we passed ; and entertained us with all kinds of stories of robberies which had been committed on travellers hereabouts, so that the ladies at last began to be rather afraid, on which he began to stand up for the superior honour of the English robbers, when compared with the French ; the former he said robbed only, the latter both robbed and murdered."

There is abundance of proof that this attribute of "honour" was not strictly deserved. Probably it was a tradition of the road, preserved from the time of Du Val, but the facts were against it, for though such a *mêlée* as took place in 1782 may not have been frequent, it shows that an English robber could murder as well as rob when opposed by force :—"In the year named the Norwich stage was attacked, on Epping Forest, by seven highwaymen, three of whom were shot dead by the guard ; but his ammunition failing he was shot dead himself, and the coach robbed by the survivors." Records of plundering by gangs of robbers are very frequent in Ireland, the individual footpad or highwayman being more generally found in England :—

"On Friday evening last," says a paragraph in the *Edinburgh Evening Courant* of 17th January 1799, "the Newry coach coming to Dublin was stopped near Highgate, at the other side of Drumcondra, by seven highwaymen, and the

passengers robbed. Shortly afterwards six or seven carriages returning from the interment of a person in the city, named Kelly, were stopped by the same gang, who plundered all the persons that were in them of what cash and portable property they could lay hands on."

SHOTPROOF COACHES.

In a former chapter, referring to Louis Philippe's iron-lined coaches, after the event of the "infernal machine," allusion was made to public conveyances treated in like manner. If the highwayman era had not come to an end, the plan would have been none the worse for general introduction. As it is, we may conclude these notices of highway robberies by a description of a stage coach lined with metal, which was constructed thirty years before the Fieschi outrage. It comes from Ireland, where the plan might even at this day commend itself to unpopular landlords or alien residents and factors, to whom any of the "finest peasantry" may have taken a dislike:—"In the year 1808," says Wakefield in his *Account of Ireland*, "a new stage coach was advertised as about to start from Dublin to Cork, and as an inducement to passengers to take places, it was emphatically stated that the vehicle was *lined with copper*, and therefore completely bullet-proof. In the course of that summer, a body of banditti under the command of the road hero of his time, Edward Brennard

(who was afterwards hanged at Clonmel), infested the mountains of Tipperary and the eastern parts of Cork, robbing people in the face of day! a practice which they were suffered to continue for several months without molestation, to the no small terror of travellers." The mail coaches (it is added) carry two guards properly armed and accounted.

The plan of protecting the mails from robbery by means of metal-lined vehicles was introduced a good many years before this endeavour to protect travellers from the "whistling ball" spoken of by the poet Cowper. Thus we read in the *Annual Register* for 1770, that "a cart upon a new construction was brought to the General Post-Office for carrying the mails." "It is lined with thin plates of iron, yet it runs much lighter than any cart that has yet been brought to the office; and which (*sic*), from its ingenious contrivance for the security of the several bags of letters, has gained the approbation of the Post-Masters." That the invention proved at once efficacious is seen by an entry under 26th August of the same year:—"This morning early, the boy carrying the Chester mail was attacked near Brown's Wells, on Finchley Common, by three foot-pads; but the bags of letters being in one of the new-invented carriages, they could not get at them, and ordered the boy to unlock it; but he telling them he had no key, they damned him, and bid him drive on." It

is curious to record that what was done in England in 1770 turned up as a new invention in America upwards of half a century later. In the year 1825, anxious for the safety of the mails, the American Congress passed a resolution for the adoption of a plan for the better securing of the letter-mails, submitted by "an ingenious individual, named Imlay." The editor of the *Washington Gazette* stated his belief, from actual inspection, that Imlay had completely succeeded in producing a strong iron case, with a spring-lock, that would in future bid defiance to robbers. He had also effected an improvement in respect to the mail coaches and waggons themselves, of which the following brief descriptions are given —

"In the mail coach the body is calculated to secure the driver from the weather perfectly; his seat is thrown back two feet; the front of the body is within the end of the sills, instead of projecting forward in the usual manner; a neat roof, with lamps and curtains of leather; also a large boot or apron to protect the driver, with side boxes for way-bills, arms, etc., leaving a large berth for mail bags under the driver, secure from storms or injury. Behind, baggage is secured by a new method, under lock and key, perfectly dry; within the body are placed the iron cases for securing the letter mails. The cases are composed of wrought iron, made in a superior manner, with locks and hinges of great strength; the cases are bolted fast to the body. If necessary, the

body will contain two cases, each holding three bushels of letters. Within the iron cases are placed portable copper or leather cases to contain the letters, all with inside locks. The body of the chariot is calculated to hold six passengers, and the cases are not the least in the way. The body is equal, if not superior, in point of room and convenience, to any, for the conveyance of passengers and mails, ever used in this country, and for summer or winter, perfectly calculated for heat or cold, having blinds with curtains and glasses. A new and much improved method for raising or lowering the body, and tightening the braces, called a rolling-jack, which removes the great difficulty of taking up the braces of stages, particularly in winter. A great improvement in the boxes and axles for carriages of this description, by which the friction is much reduced, and they run a greater distance without greasing, and require but little attention, consists in a thorough box, plated with steel at each end, and steel plates on the arm of the axle, each fitted in the most perfect manner, with a feeder in the centre for oil or grease.

"The Mail Waggon is on an entirely new plan, and is calculated to secure the mail in the same way as the chariot, having the same description of cases, and the mails perfectly secure from storms: made in every respect strong and substantial, at the same time not too heavy, and can be drawn in most roads by two horses.

The waggons are calculated to hold the largest mails; the body is placed on springs, with braces to prevent the injury so common to papers and letters owing to transporting them in waggons on the axle without springs. The driver is secure from storms; and in consequence of his being thus protected, can drive any distance necessary for one person to drive—say fifty or more miles.”

A FRENCH STAGE COACH.

M. Ramée, in the volume entitled *La Locomotion*, or *Histoire des Voitures*, from which we have made several extracts, and which may be recommended for its interesting narrative and capital illustrations, gives a highly amusing account of the *coucou*, a vehicle once familiar on the streets of Paris, and used as a kind of public stage to the surrounding towns:—

“Figure a box, yellow, green, brown, red, or sky blue, open in front, having two foul benches which had formerly been stuffed, on which were placed six unfortunate voyagers. In the sides it had, right and left, one or two square openings, to give air during the day or in summer. While the interior was sufficiently open to the world, there was built an apron in front, framed in wood-work and covered with sheet iron. Upon this apron was thrown a third bench, on which were seated the driver of the *coucou* and two passengers who were termed *lapins* (rabbits). Sometimes, on grand

occasions, such as the playing of the fountains at Versailles, two or three passengers more could be seen mounted on the top of the *coucou*. The unfortunates thus hoisted in the air were named *singes* (monkeys), and they descended regularly at a certain distance beyond the barrier, for the police regulations expressly forbade *singes*, to prevent accidents. The *coucou* had retained the primitive harness-bit modified to the eighteenth century, adapted to massive shafts, fixed upon an axletree on which turned two great and strong wheels. The solitary and unhappy horse which painfully drew this heavy vehicle, charged with nine and often twelve persons, and running four or five leagues, was most ordinarily in such a state of decrepitude that one could easily deliver a complete and profound course of osteology upon his poor carcase. . . . In irony no doubt they sometimes gave him the name of *vigoureux*. There were, however, a great number of *coucous* which, independent of the horse in the shafts, had also another, less, and more pitiful if that were possible, and which trotted at the right of the first. The costume of the driver was also most ill-conditioned and dirty, and consequently most picturesque. Very ragged, it was composed for the most part of the cast-off clothes of some rich man, of some elegant man of the world. The coat, the trowsers, and the ‘carrick,’ were strangely patched, and the bits that had been joined were never of the same colour or the same stuff.

"There has been nothing so picturesque as the whole appearance (*ensemble*) of that equipage of another time, which was found in hundreds in all directions round Paris, and of which the *personnel* was composed almost always of a mixture of shopkeepers, workmen, peasants, and soldiers. There were, however, often to be seen there ladies with lapdogs (*nichonnées*) and men very well put on (*fort bien mis*), elegants even, who did not hesitate to mount such equipages, and who, pressed to render themselves at a fête, or at the house of a friend in the country, had not been able to find a place in the gondolas.¹ I had forgotten to say that independent of the eight or ten persons of whom we have spoken, the poor horse had also sometimes to draw into the bargain three or four children, whom, from Christian charity, you placed upon your knees. . . . There are doubtless a good number of my readers who remember, with a smile on their lips, having spent two or three hours packed in a *coucou*, covered with dust, bruised and often broken on the wheel (*roués*) to make a voyage which one can to-day overtake almost without fatigue or inconvenience in the space of half-an-hour, or three quarters of an hour at the most."

After describing the manœuvres

¹ The gondola was a kind of diligence which ran at fixed hours to Versailles or St. Germain. They had four horses, carried eighteen passengers, and were *un peu aristocratique*.

of the driver to wait for more passengers, and the exercise of patience caused thereby, M. Ramée proceeds: "People had generally misfortunes in those *coucous*; in summer the dust was not wanting. Arrived at their destination they descended, then they were surrounded by boys carrying a little box with all the utensils of a shoe-black, and who, with a clothes brush, began to clean the exterior vestments if they were permitted. That cost the bagatelle of two sous, but they accepted more without making any ceremony (*sans faire de façons*). The waxing of the boots was included in that small charge."

Reference has already been made to the circumstance that in Spain some of the old-fashioned dangers and discomforts of travelling may still be encountered; and certain experiences of the gay French journalist previously quoted read not unlike those in the "basket" of an English coach sixty years earlier:—"What," asks this writer, "what would the philanthropists who give galley-slaves post chaises to ride in, say if they say the *Galeras* to which the most innocent people in the world are condemned when they visit Spain? . . . On the other side of the Pyrenees, as was formerly the case in France, a person makes his will before undertaking the shortest journey. . . The continual state of dread adds a great deal to the pleasure of the traveller, for it keeps you continually on the alert, and hinders the time from hanging

heavily on your hands . . . a journey in the diligence, which we are accustomed to look on as the most ordinary thing in the world, becomes an adventure, an expedition. . . . After all this is something in such an advanced state of civilisation as that of modern times, in the prosaic and commonplace year 1840." The writer then describes one vehicle, the Galera, in which he travelled:—"Just fancy a low waggon, with its sides formed of a number of wooden spokes at a considerable distance from each other, and having no bottom save a strip of spartum on which the trunks and packages are heaped, without much attention to the irregularities of surface which they may present. Above the luggage are thrown two or three mattresses, or, to speak more correctly, two or three linen sacks in which a few tufts of wool, but very slightly carded, float about, and on these mattresses the unfortunate travellers are stretched transversely, in a position very similar (excuse the triviality of the comparison) to that of calves that are being carried to market. The only difference is that the travellers do not have their feet tied, but their situation is not more comfortable for all that." At another place he describes another vehicle of the same kind:—"A cart on two or four wheels, with neither top nor bottom. A number of cords made of reeds form in the lower portion of it a sort of net in which the packages and trunks

are stowed. Over these is spread a mattress—a real Spanish mattress—which in no way prevents you feeling the sharp angles of the baggage thrown in anyhow beneath. The victims arrange themselves as well as they can on this novel instrument of torture, compared to which the gridirons of St. Laurence and Gantimozin are beds of roses, for on them, at least, it was possible to turn round. . . . We were thrown from one side to the other like mice when a person shakes them about for the purpose of stunning and killing them against the sides of the trap. Nothing but the severe beauty of the landscape could have prevented us from becoming melancholy or crooked in the back." Even the latter pleasure was, at another part of the journey, denied the traveller, for on exchanging the "galera" for another species of stage vehicle called the "correo real," experience was even more lively:—"When all our preparations were completed we set off in the midst of a whirlwind of cries and oaths, accompanied by a due proportion of whipping. We went at a most terrific pace, and literally flew over the ground, the vague outlines of the objects to our right and left flitting past us with phantasmagorical rapidity."

The advent of the stage coach has been held to be equivalent to the spread of "civilisation," as in the two subjoined extracts from Mr. Raikes' *Journal*, though here one can hardly avoid a smile at

the coolness with which a man so well informed as the writer, and who had mixed so freely in the world, speaks of Egypt as a "new region," and of "civilisation" being shed from "Old Europe" upon one of the oldest homes of civilisation in the world.

"February 11th, 1832.—The march of civilisation is progressing in Turkey—the Ottoman *Monitor* announces that the Government had established a high road from Scutari to Nicomede, with post horses and carriages, which travellers may obtain at a moderate price.

The result has proved so satisfactory to the Sultan that his highness has resolved upon repairing and enlarging the high roads throughout the whole Turkish Empire."

"Saturday, 7th April 1832.—Civilisation still keeps on her march; ever barbarous Egypt feels the impulse,—a stage-coach and harness has been shipped from hence (London) to run between Cairo and Alexandria. As old Europe decays and runs to seed, she scatters the means of fertility to new regions destined to succeed to her prosperity."





CHAPTER III.

No more to roadside inns, alas !
The mail-horn's music swells ;
No more upon the midnight breeze,
The mail's arrival tells.
The drowsy passenger ne'er wakes,
Roused by that midnight horn ;
That sound is dead, and never breaks
The still of the early morn.

THE OLD MAIL HORN.

(Reminiscences of a Gentleman Coachman.)

MAIL COACHES—HISTORY OF THE POST-OFFICE—MR. PALMER'S MAIL-COACH REFORM—OPPOSITION TO THE MAIL COACHES—INCREASE IN NUMBER OF COACHES—SPEED OF THE MAIL COACH—STATE OF THE ROADS—COST OF THE MAIL-COACH SYSTEM—THE COACH-BUILDING CONTRACT.

MAIL COACHES.

THE mail coach enjoyed in Britain about sixty years of undisputed sway, followed by ten years in which it struggled ineffectually to fight with its new foe, the railway. Then followed ten or fifteen years, in the course of which it absolutely disappeared as a recognised institution. The recent revival of "four-in-hand" coaches, though more correctly to be classed as belonging to the stage coach, is, in the build and general appointment of the vehicles, proper to be noticed under the head of mail coaches, though, *lucus a non lucendo*, they carry no mails. In the ninety-three years that have come and gone since Mr. Palmer proposed that coaches should carry

the mails, the mail coach has also come and gone ; and while middle-aged people may recall the brilliant equipage, the spanking horses, the gay uniforms, and the sounding horn which made the arrival of the mail the event of every town of even moderate size, the rising generation knows nothing of all this, and can only study as history what their parents may have enjoyed as a personal experience. Within the recollection of persons still young the mail coach has been driven gradually northward, till the recent opening of the Sutherland and Caithness Railway to Wick and Thurso finally extinguished and rendered historical the old mail coach. In the early years of such

a person in Edinburgh the acceleration of the London Mail to twenty-four hours, owing to the opening of the railway to Newcastle, was the marvel of the time. If the mails came in in time, the newspapers would publish a "Second Edition," giving their town readers the gist of all that the south newspapers brought, and in the morning, in buying the paper (it was then fourpence halfpenny, and one was not got every day), he would probably be instructed to ask for this second edition. Then the railway crept farther north, and the *quadriga*,¹ not yet replaced by the steam-horse, only travelled from Berwick to Edinburgh. Then a stage farther was accomplished by the railway, and so on, stage after stage, till Perth, Inverness, Bonar Bridge, Golspie, and finally Greenland, Zembla, or who knows where, the coach, horses, guard, and passengers moving off into space ! To understand all that the introduction of mail-coaches accomplished, it is necessary to have a good view of what the system of posts was before the reform accomplished in 1784. This can be best shown by a summary of the history of the Post Office service, as found in official documents.

¹ The *Currus*, or Roman chariot, was a two-wheeled vehicle, open overhead, was commonly drawn by two horses, and then called *biga*, if with three horses *triga*, and if with four horses *quadriga*. The post carriages, called *carpentæ* and *rhedæ*, were drawn by eight horses or mules.

HISTORY OF THE POST OFFICE.

The first establishment in this country of a postal service, we are told by the first report of the Postmaster-General (from which much of the following summary is drawn), is involved in some obscurity.

The letters both of private and public personages were originally sent by special messengers only, and more recently by common carriers, who began to ply regularly with their pack horses about the time of the wars of the Roses. As these carriers travelled the journey through with the same horses, this mode of transmission must have been very slow, yet it was long the only conveyance available by the public.

With reference to the first, it is stated that records in the Close and Misæ Rolls of payments to *nuncii* for carrying letters, etc., for the king, commence in the reign of King John, and are continued through many subsequent reigns ; while it appears by the Records of the City of Bristol that the Corporation paid a penny to the carrier for carrying a letter to London. Shakspeare uses the words "post" and "carrier" as synonymous. By 12 Car. II. c. 35 (1660), common carriers are excepted from the prohibition to interfere with the monopoly of carrying letters as created by that Act.

Government posts, that is relays of horses and men under control of the Government, were not established till two centuries after

John ; but as early as the time of Edward II. horses were kept by private individuals for hire, so that a messenger might travel post, *i.e.* by relays : and as "Haste, Post, Haste," is found written on the backs of private letters at the close of the fifteenth and the beginning of the sixteenth centuries, it may be inferred that the use of this mode of conveyance was not restricted to the correspondence of the Government.

In 1481, Edward IV., then at war with Scotland, is said to have established a system of relays of horses (probably from York to Edinburgh), the post stations being twenty miles apart, so that despatches were conveyed 200 miles in three days.

In the brief reign of Philip and Mary there was issued an ordinance on the subject of the cost and speed of post-horses and couriers, which is sufficiently curious to deserve reproduction entire :—



Phillipp
Mary the quene.

ORDOUNCES deuised by the
King and Queenes Maties. for
thordre of the Postes and Hac-
quenymen betweene London
and Douor.

First it is ordayned that there
shalbe ordonnairy postes laid at
Dovor, Canterbury, Syttingborne,
Rochester, Dartford, and London.

And forasmuch as the tide soe
falleth many tymes, as many
currors, taking the comoditie
thereof, use to passe by the Ryver
to Gravesend, It is ordeyned that
there shalbe a Post there appointed
to serve that Turne from thence
to Rochester, and to Dartford
from Gravesend, when need
shalbe.

Every of the Postes shalbe
bound to have alwaye the number
of vi horses at the least, ij for the
pacquett and iiij for goers and
coñers by post.

Thordonnary Posts abovesaid
shall take for every horse delivered
to runne post ij^s iij^d.

Noe man shall ride post with-
out a guide, which guide shall
ever in his Jorney have his horne,
which he shall blowe at the
Townes end, where the poste is
laid, and shalbe bound to carrie
the Currors male, being of a rea-
sonable waight.

Noe horses shalbe delivered to
runne post, but to the places, and
from place to place, where the
Posts doe lye, unlesse it be by
speciall appointment appearing by
two of the Counsell's Lettres, or
by the Master of the Postes.

In case Currors shall come so
thick, or in such numbers as the
Postes furniture will not serve,
Then the hacquenymen at th'
appointment of thordonnary postes
shall supplye the lack, and gene-
rally in all tymes of lacke, the
hacquenymen shalbe ready to
furnish in such sort as shalbe ap-
pointed unto them by the said
ordinarie post, whose request

therein they shall in noe case refuse receaving for such horses, as annie of them in this case shall deliver the self same some of money, that the said ordonary postes use to doe, when themselves do furnish, That is to saie ij^s vj^d for every horse.

Noe man shall deliver any horses to any Curror, or any other ryding in post but the ordonary post, or by his appointment, under paine of emprisonment and arbitrary fyne. And in case any hiring horses to goe by Journey, shall neverthesse ronne the Gallopp with them by the waye, the same comyng to the postes knowledge next adjoyning to the place where the said horses were hyred, he shall cause the same to be staid, and arrested, and the partie shall not be suffered to have from thens any horse, either to ronne the poste, or to goe by Journey, and the partie owing the horse shall have his a^ccon against the hirer of him.

The guides shall bring all Currors to the dore of the ordinary post, where they shall both light from their horses and take newe alsoe in the same place, and not ells where, unles at the request of such as being men of sorte, the said horses may be brought to the dore of the Inne, where they shall bayte, where they may alsoe light from their horses.

Noe hacquenymen, unlesse he shalbe appointed by the ordonary Poste, shall deliver any horse to any Curror or others riding post, but only to ride in Journey, and

for the hire of such horses, he shall neither demaund or take above ij^d for every mile under paynes of ymprisonment.

Thordonary Postes shall have a horne alwaie hanging at their dores or some other painted signe, declaring that to be the Postes house.

The Poste of Gravesend shall take for every horse xvj^d, and shall not be bound to the Conveyance of the pacquett To whome in case of lack all other hacquenymen there shalbe ready to furnishe horses, receiving for every horse soe appointed to ronne post xvj^d Neither shall any of them deliver any horses to ronne post, but by his appointment, neither take for any horse they shall hire out to goe in Journey pace above ij^d at the most for the mile as is observed.

Phillip.

Mary the quene.

THIS agreeth with the original under the proper hand of King Phillipp and quene Mary.

Ex^t p. me HUM : DYSON No-
tarium Publicum.

From the 2d volume of Proclamations in the Library of the Society of Antiquaries.

H. E.

So early as 1514, the Alien Merchants residing in London had established a Post Office of their own from London to the outports, appointing from time to

time their own Postmaster ; but in 1568 a quarrel arose among them, the Spaniards appointing one Postmaster and the Flemings another. The dispute was referred to Government. The English Merchants also appear to have presented a petition in the matter, complaining that this post acted unfairly towards them by keeping back their letters, etc., and so giving to the foreigners the advantage of the markets. The issue of this dispute is not known, but it seems to explain the expression in the proclamation by James I. hereafter noticed.

Some years ago the Bishop of Llandaff drew the attention of Mr. (afterwards Sir) Rowland Hill to the following curious extract from the correspondence of Archbishop Parker :—

Archbishop Parker to Sir W. Cecil.

Sir—According to the Queen's Majesty's pleasure, and your advertisement, you shall receive a form of prayer, which, after you have perused and judged of it, shall be put in print and published immediately, etc. etc.

From my house at Croydon, this 22nd July 1566, at 4 of the clock afternoon.—Your honour's alway,

MATTH. CANT.

To the Right Honourable Sir W. Cecil, Knight, Principal Secretary to the Queen's Majesty, and one of her Privy Council.

(Indorsed by successive Postmasters.)

Received at Waltham Cross, the 23rd of July, about 9 at night.

Received at Ware, the 23rd July, at 12 o'clock at night.

Received at Croxton, the 24th of July, between 7 and 8 of the clock in the morning.

So that his Grace's letter, leaving Croydon at 4 in the afternoon of July 22d, reached Waltham Cross, a distance of nearly 26 miles, by 9 at night of the 23d ; whence, in three hours, it seems to have advanced 8 miles to Ware ; and within eight hours more to have reached Croxton, a further distance of 29 miles ; having taken nearly 40 hours to travel about 63 miles, at the rate of a very slow walking pace throughout.

In addition to this illustration we learn that so far as the reign of Elizabeth is concerned, the existence of posts, for public dispatches at least, has been inferred from the mention in Camden, that Thomas Randolph was appointed chief postmaster of England in 1581 ; and it appears that in Ireland the first horse posts were established in this reign during O'Neil's wars, for the purpose of bringing intelligence of military events.

The first establishment of a Letter Post by the Government was in the reign of James I., who, as is stated by a proclamation of Charles I., set on foot a Post Office for letters to foreign countries "for the benefit of the English merchants ;" but nothing of the kind seems to have been done for the accommodation of inland correspondence, and special messengers were still employed to carry the letters of the State.

It was not till the middle of the reign of Charles I. that a Post Office for inland letters was established. In 1635 that King issued a proclamation in which he recited that up to that time there had been no certain communication between England and Scotland, wherefore he now commands his Postmaster of England for foreign parts to settle a running post or two, to run night and day between Edinburgh and London, to go thither and come back again in six days, and to take with them all such letters as shall be directed to any post town in or near that road. It was at the same time ordered, that bye posts should be connected with many places on the main line, to bring in and carry out the letters from and to Lincoln, Hull, and other towns; a similar post to Chester and Holyhead, and another to Exeter and Plymouth, were to be established; and it was promised that as soon as possible the like conveyances should be organised for the Oxford and Bristol road, and also for that leading through Colchester for Norwich. By a subsequent proclamation of 1637, it is ordered that no other foot posts should carry any letters but those alone which shall be employed by the King's Postmaster-General, unless to places to which the King's posts do not go, and with the exception of common known carriers, or messengers particularly sent on purpose, or persons carrying a letter for a friend.

In 1649 the Common Council

of London set up a post in rivalry with that of the Parliament. But the Commons, although they had loudly denounced the formation of a monopoly by the Crown, promptly proceeded to put down this infringement of their own monopoly; and from this time the carrying of letters has been in the hands of Government.

In Scotland, although the proclamation of 1635 provides for the conveyance of letters from London to Edinburgh, no provision seems to have been made at that time for an internal post; but during the last half of the seventeenth century, several internal posts were established on the principal lines of road, though without any legislative enactment to that effect, until the time of William III., when, in 1695, the Scottish Parliament passed an Act for the general establishment of a Letter Post.

In 1710 the statute of Anne was passed, which remodelled the law of the Post Office, and remained until 1837 the foundation of that branch of the law. By its provisions a General Post Office for the three Kingdoms and for the Colonies was established under one head, who was to bear the style of "Her Majesty's Postmaster-General," and was empowered to keep one Chief Letter Office in London, one in Edinburgh, one in Dublin, one in New York, and one in the West Indies.

After the passing of the statute of Anne, the next event deserving

notice was the farming of the Cross Posts by Ralph Allen, Postmaster and Mayor of Bath, in 1720. This was the Allen commemorated by Pope in a couplet in the *Epilogue to the Satires* of which one line has become classical.

Let humble *Allen*, with an awkward shame,
Do good by stealth, and blush to find it fame.

Allen observed that the organisation of these posts was very imperfect, and that they were so few in number that many districts were unprovided with a postal service, while in other cases letters passing between neighbouring towns were conveyed by very circuitous routes, which in those days of slow locomotion caused serious delays; and he thought that a great improvement both of the revenue and in public accommodation might be effected by an extension and rearrangement of the Cross Post system. He thereupon induced the Government to grant him a lease of the Cross Posts for life at a rent of £6000 a year, and carried into effect his intended improvements, realising an annual profit of upwards of £12,000, which he lived to enjoy for forty-four years, spending it mainly in works of charity, and in hospitality to men of learning and genius.

On the death of Allen, in 1764, the Cross Posts were put under Mr. William Ward, who (for a salary of £300 per annum) undertook to hand over their pro-

fits, which then amounted to about £20,000 a year, to the Crown.

It is not necessary to give in greater detail the earlier history of the Post Office, which can be found in an exhaustive shape in Mr. Lewin's excellent volume *Her Majesty's Mails*, from which a few of our facts have been borrowed.

To bring the narrative down to the point of the advent of mail coaches, it may be advantageous to furnish a few facts as to the mode of conveyance and the speed of the mail service at a period immediately before that time. The following way-bill of an express between Edinburgh and London in 1762 is both useful and instructive:—



FOR HIS MAJESTY'S SPECIAL SERVICE.

WE His Majesty's Postmaster-General of Great Britain, Ireland, &c., do hereby, in His Majesty's Name, and for His Special Service, require you in your respective Stages, to use all Diligence and Expedition in the safe and speedy Conveyance of *these Packets annexed*; as the same is directed and intended.

You are not to fail to ride with the same Five Miles every Hour

TO LONDON

And when you receive this Express, you are to give the Person that brings it a Receipt under your Hand, mentioning the Day and Hour you receive the same; you are likewise to direct the Person by whom you shall forward this Express, to demand a Receipt of the Deputy-Post-Master at the next Stage; and constantly to observe this Method

in all Expresses that come to your respective Stages, as you will answer the contrary at your Peril.

BESSBOROUGH, } *Post-Master*
ROBERT HAMPDEN, } *General.*

To the several Post-Masters on the *South Road.* } *To London.*
Haste, Haste, Post Haste. }

General Post-Office, EDINBURGH,
July 21st, 1762.

At $\frac{1}{2}$ past One in the Afternoon.
THOS. MABANE.

Recd. at Hadington at past four
afternoon and sent away Immediately.
HENRY HEPBURN.

Recd. att Six sent away Emedetly
by JANET CASBELLAN.

Received at Old Cambus at Eight
o'Clock and Dispatched Immediately
pr. JAS. GRIVE.

Recived at Berwick July 21th, 1762,
at $\frac{1}{2}$ past Eleven at night, and Sent
away at Twelve at midnight by JAMES
GRIEVE.

Recd. at Belford July 22, 1762, at
three in the morning and sent away $\frac{1}{2}$
past by WM. BUGG.

Recd. at Alnwick at $\frac{1}{2}$ past six in
ye morning and sent away (time and
signature illegible).

Recd. at Morpeth at $\frac{1}{2}$ past nine in
the day and sent away Immediately.
p. T. J. SARLE.

July 22th Recd. at N'Castle at $\frac{1}{2}$
past Twelve Noon and sent away $\frac{1}{2}$
past ditto. p. H. BELL.

Recd. at Durham $\frac{1}{2}$ past 2 o'Clock
& Dispatched——

Recd. at Darlington at $\frac{1}{2}$ p——
——and Dispatched Inead——
——at Nothallerton——

[Here the Bill is illegible.]

Recd. at B: Bridge 50 minutes past
12 and Dispatcht at 5 minutes past one.
p. THOS. MANN.

Recd. at Wetherby at four and sent
at quarter past.

W. COTESWORTH.

Recd. at Ferrybridge at $\frac{3}{4}$ past Six
and sent away at Sev'n. J. WAINE-
WRIGHT.

Recd. at Doncaster 10 minutes past
nine and sent away 25 minutes past.
p. M. NEWBOLD.

Recd. at Bawtry at half-past eleven
and sent away with speed. pr. R.
SHAW.

Recd. at Tuxford $\frac{1}{2}$ past three——
 $\frac{3}{4}$ past by THOS. HARRIS.

Recd. at Newark at $\frac{3}{4}$ past Seven
and sent away directly. A. H.

Recd. at Grantham at Twelve and
sent away Immediately. p. WM.
A——.

Recd. at Colessersworth at $\frac{1}{2}$ past
One and sent away Immedly. p. S.
TINKLER.

Recd. at Stamford at $\frac{1}{2}$ past Three
and sent with speed by BENJN. BER-
RISFORD.

Recd. at Stilton half-past five and
sent away with speed. T. MASON.

Recd. at Huntingdon at half-past
Seven and sent with speed. H.
GRANT.

Recd. at Caxton at Nine & sent with
speed. R. CULLEN.

Recd. at Royston at Eleven, sent
with speed. E. GATWARD.

Recd. at Ware two & sent Immedi-
ately. J. SHURSHALL.

Recd. at Enfield at four and sent
away Immediately.

A. HAMILTON.

This document, interesting from
the light it throws upon the route
and the speed of an express at the
middle of last century, bears
an endorsement to the following
effect :—

No. 15.

"The Way Bill of an Express from
THO. WATSON Esqre. Reced. at
Greys Inn July 24, 1762 at abt. 10
minits past 7 o'clock Evening.

"21 July 1762."

The express left Edinburgh at
1.30 P.M. on 21st July, and
reached Gray's Inn in London at
7.10 P.M. on 24th July, or a

period of $77\frac{1}{2}$ hours, and as the way-bill shows the journey to have been carried on night and day, the speed only averaged a fraction more than five miles an hour.

The condition of the mail service in Scotland at the period referred to is very well described in the historical sketch of the Post Office in Scotland prepared for the Postmaster-General in 1856. There we find it recorded that—"in 1716 the Duke of Argyll, who had then supreme control in Scotland, gave orders to place relays of horses from Edinburgh to Inverness, for the purpose of forwarding despatches to, and receiving intelligence from, the army in the Highlands under General Cadogan. These posts worked upon two lines of roads: the one went through Fife and round by the east coast, passing through Aberdeen; the other took the central road *viâ* Perth, Dunkeld, and Blair-Athol. These horse-posts were, however, discontinued immediately after the army retired.

"About the year 1750 the mails began to be conveyed from stage to stage by relays of fresh horses, and different post-boys, to the principal places in Scotland; but the greater portion of the mails were still carried by foot runners. Before the system of relays was introduced on the North Road, the mode of conveying the mails was very tedious. For instance, a person set out with the mail from Edinburgh for

Aberdeen; he did not travel a stage, and then deliver the mail to another post boy, but went on to Dundee, where he rested the first night; to Montrose, where he stayed the second; and, on the third, he arrived at Aberdeen, and, as he passed by Kinghorn, it behoved the tide, and sometimes also the weather, to render the time of his arrival more late and uncertain. In this manner the mail was conveyed thrice a week. The communication by post between London and Edinburgh was not much better. The condition of the roads, however, in Scotland would not admit of anything like rapid travelling. The best roads, even in the populous districts, were often to be found in the channels of streams. The common carrier from Edinburgh to Selkirk, 38 miles, required a fortnight for his journey going and returning; the channel of the river Gala, which for a considerable distance ran parallel with the road, being, when not flooded, the track chosen as the most level and easiest to travel in. Between the principal cities, the means of travelling were little better. It took a day and a half for the stage coach to travel from Edinburgh to Glasgow.

"In the year 1757 the mail was upon the road from London to Edinburgh 87 hours, but from Edinburgh to London, 131 hours. At this time, from a representation from the Convention of Royal Burghs, such regulations were adopted, that the time was reduced to 82 hours from London to Edin-

burgh, and 85 hours from Edinburgh to London.

"In 1763, a further improvement was made on the London mail, by having it despatched five times a week instead of three as formerly. Previously it had travelled in so dilatory a manner, that in winter the letters which were sent from London on Tuesday night, for the most part, were not distributed in Edinburgh till Sunday between sermons."

The same report also states that "in 1776, the modern stage coach was introduced into Scotland; the first coach arriving in Edinburgh on the 10th of April. It is stated to have performed the journey to London in 60 hours;" but from another authority we learn that "in 1763, there was but one stage coach between Edinburgh and London, which started once a month from each city and took a fortnight to perform the journey."

The *Edinburgh Courant* of 1754 contains an advertisement quoted in a previous page:—"The Edinburgh stage coach, for the better accommodation of passengers, will be altered to a new genteel glass coach machine, hung on steel springs, exceeding light and easy, to go in ten days in summer and twelve in winter, to set out the first Tuesday in March, and continue it, from Hosea Eastgate's, the Coach and Horses, in Dean Street, Soho, London; and from John Somerville's in the Canongate, Edinburgh, every other Tuesday, and meet at Burrowbridge on Saturday night, and set out from

thence on Monday morning, and get to London and Edinburgh on Friday. In winter, to set out from London to Edinburgh every other Monday morning, and to go to Burrowbridge on Saturday night; and to set out from thence on Monday morning, and get to London and Edinburgh on Saturday night. Passengers to pay as usual. Performed, if God permits, by your dutiful servant, HOSEA EASTGATE."

The speed of this coach was not better than those already existing, but it sought public favour on the ground of additional comfort in travelling. Probably the reference in the Postmaster-General's *Summary* to the "modern stage coach" may be to the flying coach, which, doing the distance in 60 hours (or at an average speed of 7 miles or 8 miles an hour), might well be denominated the first of its kind.

The condition of Ireland, as regards its mails, was even less promising than that of England or Scotland previous to the mail-coach era. Some interesting particulars on this subject, compiled by Anthony Trollope in 1857, are given in the third Report of the Postmaster-General.

MR. PALMER'S MAIL-COACH REFORM.

We now approach the time when a decided step in advance was to be made; when the improvement of the roads, through the labours of Telford and "stone-

breaking Macadam," was to go hand in hand with the development of excellent mail coaches, and to culminate between 1820 and 1840, when, on the authority of those best acquainted with the subject, the mail coach system was at its best.

"In 1784" says the Postmaster-General's First Report, "one of the greatest reforms ever made in the Post Office was effected by the introduction of the plan of Mr. John Palmer. Up to that time the mail bags had been carried by post-boys on horseback, at an average rate, including stoppages, of from three to four miles an hour. Mr. Palmer, in his scheme submitted to Mr. Pitt in 1783, gives the following account of the then existing system: 'The Post, at present, instead of being the swiftest, is almost the slowest conveyance in the country; and though, from the great improvement in our roads, other carriers have proportionably mended their speed, the post is as slow as ever. It is likewise very unsafe, as the frequent robberies of it testify; and to avoid a loss of this nature people generally cut bank bills or bills at sight in two, and send the bills by different posts. The mails are generally intrusted to some idle boy, without character, mounted on a worn-out hack, and who, so far from being able to defend himself or escape from a robber, is much more likely to be in league with him.'

"Mr. Palmer, who was mana-

ger of the theatre of Bath, had observed that when the tradesmen of that city were particularly anxious to have a letter conveyed with speed and safety, they were in the habit of enclosing it in a brown paper cover, and sending it by the coach, though the charge for such conveyance was much higher than the postage of a letter. He therefore proposed that the mail bags should, as far as possible, be sent by the passenger coaches, accompanied by well-armed and trustworthy guards. He also suggested other important alterations, as that the mails should be so timed as to arrive in London, and, as far as might be, in other places, at the same hour, so that the letters might be delivered altogether; and that they should be despatched from and arrive in London at a time convenient to the public, the mails having hitherto left London at all hours of the night."

It has been conjectured that, as Palmer was manager of the theatres of Bristol and Bath, his attention was drawn to the slow postal communication, as compared with the more rapid stage coaches then seen on most of the roads, through his correspondence with actors in London, and the journeys he had to make in connection with his profession. Be that as it may, he presented a report to Pitt, then Prime Minister, in 1783, in which his scheme was put before the minister with a force and completeness which at once attracted the attention of that statesman.

The bitter opposition of the officials of the day was, of course, to be anticipated. No person likes to have his own professional knowledge excelled by an outsider, or to have reforms, which should have been obvious, promoted from without, seeing that such an occurrence is in itself a condemnation of the official, as not being alive to the possibilities of his own department. Consequently, it is not surprising that so bold an innovation as that proposed by Palmer should meet with strenuous opposition and narrow criticism. To oppose it with any effect it was of course necessary to maintain that the existing system was both sufficient and efficient. And the Post Office officials did not hesitate to make the assertions. Accordingly we read that "the oldest and ablest officers in the service" looked on Mr. Palmer's proposals as impracticable, and dangerous to commerce as well as to the revenue. One prominent official expressed amazement that "any dissatisfaction or desire for change should exist," and went so far as to maintain that "the post as then managed was admirably connected in all its parts, well regulated, carefully attended to, and not to be improved by any person not acquainted with the whole." The last insinuation was the "most unkindest cut of all." Mr. Palmer possibly was not acquainted with every minute detail of the postal service, but he was well informed as to the

abuses, as these were patent to everybody, the complacent officials alone excepted. The latter denied Mr. Palmer's premises, that the post ought to outstrip all other conveyances, and "could not see why the post should be the swiftest conveyance in England," holding that personal conveyances, and particularly persons travelling on business, should be much more so. The proposal to arm the guards sent with the mail coaches, which Mr. Palmer was undoubtedly moved to suggest through the great frequency with which the mounted post-boys were being robbed at the time, was objected to as futile, and as likely to add murder to the crime of robbery, "for when once desperate fellows had determined upon robbery, resistance would lead to murder."

With this last remarkable argument we may well leave the official opponents of the great reform, and proceed to state briefly that what they thought was an "impossibility," was accepted with full confidence by Mr. Pitt and his ministry. On the 2d of August 1784, the first or trial mail coach was run between London and Bristol, leaving London at eight in the morning and reaching Bristol at eleven the same night, the return coach performing the journey in sixteen hours. Between Bath and London the time was fourteen hours, though it had been declared by the Post Office obstructionists to be "an impossibility that the Bath mail could be brought to

London in sixteen or eighteen hours." Formerly the post between those two cities had occupied the better part of two days.

The beginning thus made speedily spread through the kingdom, the chief cities, such as Liverpool, making early application to have the same rapid means of communication extended to them. The coach to Liverpool was granted after a short time, and it is described as a small vehicle drawn by two horses, which were changed every six miles. They carried four passengers, besides the coachman and guard. The latter were dressed in livery, and the guard was armed to the teeth as a security against highwaymen.

The success of the scheme was decided and unmistakable. "By 1797" (we read in Mr. Lewin's book) "the greater part of the mails were conveyed in one half of the time previously occupied; in some cases in one third of the time; and on the cross roads, in a quarter of the time taken under the old system. Mails not only travelled quicker, but Mr. Palmer augmented their number between the largest towns. . . . Three hundred and eighty towns, which had had before but three deliveries of letters a week, now received one daily. The Edinburgh coach required less time by sixty hours to travel from London, and there was a corresponding reduction between towns at shorter distances." Mr. Palmer for eight years personally directed the new mail coaches as Controller-General,

after which he retired with a pension of £3000 a year. In 1813, after a struggle of twenty years, a grant of £50,000 additional was made—not an excessive recognition of such a great national service. Mr. Palmer died in 1818.

OPPOSITION TO THE MAIL COACHES.

With the removal of Mr. Palmer's personal control over the new system of conveyance came the revival of attempts within the Post Office to bring discredit on the system and to secure a return to the slow ways of the past. Happily all these were frustrated, and Mr. Palmer's plans were adhered to, though he himself had been removed from the management. The new mail coaches were, however, subjected to opposition from a different quarter, namely from the owners of stage coaches by which no mails were conveyed. The form this opposition assumed may be best illustrated by the following letter from Mr. Palmer's agent, written a year after the new mail coaches had been introduced:—

To the Printer of the
Whitehall Evening Post.

SIR—The liberal and impartial principles upon which your paper is conducted would have secured insertion to whatever the friends of the mail coaches might have been inclined to offer, in contradiction to the innumerable paragraphs, advertisements, and letters, that have of late been so industriously foisted upon the publick,

by those whose obstinacy and folly have deprived them of the contracts they wished for, and who, in consequence, have exercised their spleen in every unworthy way that inveterate malice and falsehood can suggest; but it would have been an insult to common understanding to imagine the publick could be misled by such feeble devices, and therefore their authors have been treated with the silent contempt they deserve. Not contradicted, they grow more bold in their practices, and as the signature of real names now gives colour to the falsehoods they have propagated, it is but justice to those they mean to prejudice, that the world should be informed how little credit these representations are entitled to.

To refute the impositions of one of these gentlemen, I beg leave to present the following letters from proprietors of a mail coach concern he has honoured with his particular notice, which not only shows the veracity of this reformer, but answers very fully the many paragraphs that have been founded upon the "cruelty and torturing treatment so many thousands of the most noble and useful animals of the brute creation receive, since the establishment of mail coaches," and will, it is hoped, somewhat abate the poignant concern expressed on this account, by men possessed of such extraordinary fine feelings as the writer of these paragraphs affects to be.

(COPY.)

"Norwich, 16th Sept. 1785.

"Sir—A letter having appeared in Lloyd's Evening Post of Wednesday, Sept. 14th, signed F. A. Phillips, Berkeley-square, we think it necessary to contradict immediately so much of it as relates to the Norwich mail coaches, by saying, that no horse has ever dropped dead in either of the mail coaches on the Norfolk roads, and that the horses employed in that undertaking are in remarkable good health, and full vigour, and there being

one rest horse allowed for every two actually at work, they are likely to perform their respective stages (which are very short) with perfect safety.

"We have the honour to be,

"Sir, your most obedient servants,

"H. REPTON,

"JOHN CROUSE.

"To J. Palmer, Esq."

The same gentleman asserts that the letters were one morning brought to the office in a whiskey, *because* one of the western mail coaches broke down. This is likewise false. A whiskey is in waiting at the Inn every morning against the coach arrives, on purpose for the coachman and guard to take the bags up to the office in.

Equally false is his story of the accident that befel the Bristol mail coach, in endeavouring to outrun the Stains mail cart with one horse. The coach kept its regular accustomed pace; the effort to outrun was on the part of the cart-boy.

Neither will truth countenance him in his report of Mr. Palmer's being in the Post-Office yard; of his chagrin, his confusion, and his mortification. Mr. Palmer was never yet in the yard at the time either of the coach's arriving or departure, which is too immaterial to be mentioned, but that it serves more effectually to prove the strict regard that is paid to truth in every thing this gentleman signs his name to.

For a further contradiction of what he has asserted, I refer him to a letter in Lloyd's Evening of last Wednesday, signed by Mr. Peech, of Sheffield, who works the Leeds mail coach ninety-four miles every day, and who attests that no accident whatever has happened to the mail coaches in that part of the country, except a broken axle-tree the very first journey before the carriage was seasoned, and by which neither passenger, coachman, or guard received the least injury. Not so (as he remarks) with the coaches belonging to people from whose houses most of the paragraphs against mail coaches are sent to the printers, for "the stage

that goes from the Saracen's Head, Snow Hill, and which puts up at the Tontine Inn at Sheffield, overturned near Stamford with eleven passengers, and only one of them escaped without a broken bone, or a shattered limb." Such dreadful calamities as these can never happen to a mail coach, because they carry no outsiders.

There are one or two other writers on this subject, who have ventured their signatures to what they have asserted, but their productions are too insignificant to make any impression, and therefore unworthy the trouble of contradicting.

As for the anonymous falsehoods that are printed and reprinted with every aggravation that malicious embellishment can furnish, they are much too numerous to be noticed so particularly; many of those paragraphs would not have obtained insertion even where they did, if they had not been paid for as advertisements, and the writer's name left for the printer's security; nay, some of the invectives they framed, and offered to the papers, were so notoriously wicked and false, that even the authors of them, with all their temerity, shrunk from the printers' requisition of their signatures to what they brought, and rather than be proclaimed capable of such infamous devices, their fears for the consequence induced them to skulk away with the evil instrument of premeditated mischief in their pockets. These are facts I am in full possession of, and am authorized to bring forward evidence to confirm them, if necessary.

Inflammatory paragraphs, advertisement, and hand-bills, teeming with the grossest lies, have been exhibited by their authors and agents, in taverns, coffee-houses, and inns, on the several roads, and in the principal country towns, as well as in the metropolis. Rewards have been offered to abandoned wretches to take out a mail-coach linch-pin, while the carriage has been stopping to take up a passenger; thereby to endanger the limbs and lives of the travellers, for the horrid gratification of being able to raise a popular cry

against mail coaches, by publishing it afterwards in all the papers. They have even bribed a wretch to hire himself for a mail coachman, on purpose to overturn the carriage; and having performed his diabolical undertaking, they, in addition to his promised reward, had so little regard to decency, as to mount him directly upon one of their own coachboxes, where he now flourishes his whip in triumph. This service was too important to be trusted to any other than a relation to one of the proprietors in the opposition. He proved his consanguinity by his conduct. Provident measures, however, are now taken to defeat such iniquitous contrivances in future.

They have taken uncommon pains to establish an idea of the Mail Coaches being unsafe, on account of their rapid rate of going, whereas the truth is, they do not on any road in the kingdom exceed the ordinary rate of post-chaise travelling; their contracts require them only to go eight miles an hour, stoppages included, which is the utmost they have ever yet accomplished.

Had the proprietors of Mail Coaches been disposed to follow such illiberal examples, they would have found sufficient materials for retaliation, in the many misfortunes that have happened lately, by repeated overturning and breaking down of their opponents' carriages, several of which, heavily laden with outside passengers, have recently (one within these few days) encountered calamities, the shocking recollection of which makes humanity shudder.

The Mail Coaches belonging to the Norfolk district have in the space of twenty-two weeks travelled seventy-eight thousand five hundred and forty miles, and met with only two accidents, both of which were occasioned by the carelessness of the drivers, for which they were discharged. They were themselves the only sufferers, for not a single passenger was hurt in either case.

All carriages, publick and private, must ever be liable to accident, but that passengers in Mail Coaches are

better secured from the dangers that are incident to all, than those who travel in any other carriages, cannot be disputed, when it is known, that though they even now travel near four thousand miles every day, no accident of any consequence has befallen any one who has rode in them from their first starting to the present moment. Can the like be said of any other description of publick carriages travelling an equal number of miles? A horse may fall, an axletree may break, but horses above their work, like those in Mail Coaches, are not so liable to fall, nor are axletrees so liable to break when unoppressed by heavy loads of outside passengers. There is one circumstance of safety peculiar to Mail Coaches, which is that of having two coachmen constantly upon the box to keep each other awake, and to assist in case of accident (for most Mail Coach Guards are Coachmen by profession), and perhaps it is to this advantage, as much as any other, that their extraordinary exemption from misfortunes is to be attributed.

It is reasonable to suppose, that people capable of propagating the falsehoods I have detected, and of practising the infamous arts I have exposed, will rather be irritated than silenced by what I have done; but common justice, and the respect that is due to the publick, demanded some contradiction should be given to assertions so notoriously calculated to mislead, which having done, I shall take no further notice, either of anonymous attacks or of the more specious, though (as I have made appear) equally false, assertions and arguments of such as scruple not to subscribe their names to the mischief they meditate.

I am, Sir, your very humble servant,
C. BONNER.

*London Agent to
Mr. Palmer's Post Plan.*

*September 26th, 1785.
No. 87 Lombard Street.*

P.S.—Since I have written the foregoing, another dreadful accident has transpired that happened a few days

since to a northern stage coach, by which one lady was killed on the spot, another terribly bruised, and a young man's arm crushed to pieces. If passengers in a Mail Coach should ever encounter such shocking calamities as hitherto they have been perfectly secured from, it is hoped the recollection of the many tragical events that have lately befallen travellers in other carriages, will at least deprive their illiberal opponents of any right they may assume to persuade the publick of their being *more* dangerous than any other description of conveyance. Truth, with every confirming evidence, proclaims that at present they are infinitely beyond all comparison the safest.

It will be noticed from this letter that the mail coaches carried "no outsides." This was not of long duration apparently; as the mail coaches, in their palmiest days, carried a goodly proportion of outside passengers. The excessive speed to which reference is also made in this letter was a common ground of objection to the Palmer coaches. When, later, the speed was increased to ten miles an hour, which the improvement of the roads as well as the improvement of the coaches rendered possible, it was thought (by the opponents of the mails) to be a temptation of Providence to travel so fast. Lord Campbell relates that he was frequently warned against travelling in the mail coaches on account of the fearful rate at which they flew, and instances were supplied to him of passengers who had died suddenly of apoplexy from the rapidity of the motion!¹ One

¹ This objection recalls an incident chronicled by Boswell—"Lord Powers-

immediate result of the establishment of mail coaches in England was to stop the robbery of the mails, as, for many years at least, no attempt was made to rob one of Palmer's coaches.

INCREASE IN NUMBER OF COACHES.

It is convenient from this point again to speak of stage coaches under one head, whether carrying mails or not, as the questions of speed, of equipment, of cost, and of the social features of the system of travelling during the first forty years of this century, are sufficient alike in both classes of vehicles to be dealt with together. By the end of the last century, as we have seen, a vast improvement had taken place both in the speed and the number of the posts to the principal towns, while the places were to be reckoned by hundreds where improved service had been rendered. By the opening up of new routes, also, something had been done, so that, if it be true, as alleged by Charles Knight, that "the seats of ignorance are in the villages where never mail horn has been heard," the instructive notes of the mail guard's cheery horn were now diffusing educational influences in many quarters that were formerly sitting in darkness.

court, we are informed, laid a wager in France that he would ride a great many miles in a certain short time. The French Academicians set to work and calculated that, *from the resistance of the air, it was impossible*. His lordship however performed it."—*Roswell's Tour to the Hebrides*, 24th Sept.

Of the general increase in the number of coaches in the years that followed a few illustrations may suffice. Fifty years' progress is very well illustrated in the statement that "in the year 1770 there belonged only two stage coaches to Manchester, one to London, the other to Liverpool, and they went only twice a week. There are now (1820) 20 coaches passing backward and forward between those two places." In the *Scots Magazine*, from which the above figures are taken, we find the following statement regarding other leading towns in the kingdom :—

"It is calculated that a person has 1500 opportunities of leaving London in the course of the 24 hours by stage-coaches, including the repeated trips of the coaches which ply the short distances. It is understood that about three hundred stage-coaches pass through Hyde Park corner daily. There are about 40 Brighton coaches. There are 84 coaches belonging to Birmingham, of which 40 are daily ; to Chester 19, of which 16 are daily ; to Manchester 70, of which 54 are daily. There are 60 coaches belonging to Liverpool, of which 56 are daily ; to Preston 12, to York 18, of which 10 daily, to Hull 12, to Newcastle 6, to Glasgow 13, to Edinburgh 30, to Aberdeen 9, to Inverness 3, and to Whitehaven 3." Here it may be remarked that by counting "flies," machines, and diligences, a writer of fifty years earlier brings out a larger total for the whole kingdom than is shown in the above

extracts, for we are informed in the *Annual Register* for 1775, that it "may be gathered from authentic papers, that the stage coaches generally drove with eight inside, and often ten outside passengers each, and that there were then of these vehicles, flies, machines, and diligences, upwards of 400; and of other four-wheeled carriages, 17,000."

In 1820, travelling by public coaches had received a vast development, and the figures of the writer in the *Annual Register* must have been made up on a plan including vehicles to which the name of stage coach could not be properly given, or, what is equally probable, it was an estimate "evolved from his inner consciousness," and based on no solid ground of statistical fact.

From Hay's *History of Arbroath*, recently published, the bustle and gaiety which the mail and stage coach system infused into the life of even a small road-side town are admirably portrayed, showing also the number and variety of vehicles on the road in the year 1826:—

"Mail coaches and stage coaches passed through the town daily, bringing with them that stir which helped to enliven the towns and villages that were situated, like Arbroath, on some great line of road. In addition to the coach that carried his Majesty's mails, the 'Saxe Cobourg' coach passed by way of Arbroath on the road from Edinburgh to Aberdeen. Then there were the 'New Times' from Aberdeen to Perth; the

'Highlander' from Montrose to Dundee; and the 'Commercial Traveller,' which ran daily between Arbroath and Dundee. These and other stage coaches supplied the town with its principal means of communication with neighbouring and distant places. The Town-Council memorialised the Post Office Department in 1826 to put on a diligence between Arbroath and Forfar. The Post Office agreed to do so for twelve months as an experiment, provided the toll duties were remitted. To meet this condition it was necessary for the town to raise a subscription, as the road trustees declined to remit more than half of the dues. Besides the bustle necessarily caused, the daily arrivals and departures of mail and stage coaches at Mr. Seaton's White Hart Hotel introduced a certain element of picturesqueness into the streets of the burgh. Another place in the neighbourhood, now quiet enough, which was enlivened by the road traffic was Woodside Inn, the half-way house to Dundee."

In 1836 there were fifty four-horse mail coaches running in England, thirty in Ireland, and ten in Scotland. In England there were besides forty-nine mails conveyed in vehicles with two horses each. In 1837 the number of licensed stage coaches was above 3000, and mail coaches were 103 in number.

Just before the railway was introduced, we learn that seven coaches in all ran between Edinburgh and London daily, perform-

ing the journey in about forty-eight hours, though sometimes in a shorter time. At the same period there were twenty-eight mail coaches leaving London each evening at the same hour, namely eight in the evening, the starting of the mail coaches being for many a day one of the most attractive spectacles which a Londoner could present to his country cousins. It was part of Palmer's plan, adhered to from the first and still forming the basis of the postal arrangements throughout the kingdom, that the mails should be timed to leave London and to reach that city as near to one hour as possible.

SPEED OF THE MAIL-COACH.

About the year 1820 some considerable augmentation of speed was found practicable in mail-coach travelling in this country, in consequence of the improvement of the roads. The improvement of communication was general throughout the kingdom; as we learn from a magazine of 1819 that within a few months many new and excellent arrangements had been adopted throughout the country for expediting the mails. "Liverpool now receives all its letters, with the exception of the York mail, early in the morning instead of at various hours in the day, and despatches them many hours later (after exchange time) than it formerly did; with a despatch one day later of its foreign letter intended for the Continent.

A complete and direct chain of mail coaches proceeds about 1000 miles from Penzance to Thurso, by Bristol, Birmingham, Manchester, Carlisle, Edinburgh, and Aberdeen. By a late junction at Manchester, Scotland receives and despatches letters one day quicker each way, and by a newly established mail coach from Aberdeen travelling daily to Land's End and Thurso, through a country no stage coach ever went, and where in general no post-horses were kept, in most instances letters reach that extremity of the island several days sooner."

Three years later the then existing speed was used as an argument for further acceleration — an acceleration which was attained at an early date. In *Blackwood's Magazine* for November 1822 appeared a "Plan for Expediting the Mail between London and Edinburgh," from which the following is taken:—

"The rate of travelling of the mail coach from London to Edinburgh was formerly about seven miles per hour; for a considerable time past it has been eight miles and a half per hour the whole way, exclusive of refreshments.

"Since the Edinburgh mail began to run at the rate of eight miles and a half an hour, the whole of the road through England has, in consequence of the adoption of the measures suggested by Mr. Macadam, been greatly improved in the solidity and smoothness of its surface, and is still daily improving in these respects.

"It is known to those who have been in the habit of travelling in the mail, that the increase of speed to eight miles and a half per hour, instead of being an oppression to the horses, was a relief to the horses. When the mail went at the rate of only seven miles per hour, the coachman, having time to spare, used to stop at the ale-houses and loiter it away; and often, on finding they had stayed too long, in order to complete their stage in the time allowed them, drove the horses at a much faster rate than eight miles and a half per hour, over the roads in their old rough, rutted, and loose state. Now they have little time to spare, and the horses are driven steadily and regularly; consequently, though their rate on the average is much greater, they are much less distressed.

"If the mail could travel eight miles and a half per hour twelve months ago, it could now, in the much improved state of the roads, travel with equal or greater ease at the rate of nine miles an hour, including all stoppages. . . . Persons connected with stage coaches say that there would be no difficulty in conveying a stage coach of the weight of the mail coach, with its letters and passengers, at the rate of nine miles an hour along the whole road, with profit to the owners, provided it was a well-employed coach. It would, of course, be necessary to run none but good horses with some blood in them,

and to drive short stages. As the whole time of travelling the journey will be shortened, passengers will more frequently go through the whole way than at present, which will insure better employment for the mail coach; and as, for the same reason, fewer stops for refreshment will be necessary, including them in the general rate of travelling will not be so great an addition to the exertion as might at first appear—they will need to be four; breakfast, dinner, and supper, the day after setting out, and breakfast on the following day. Should it, however, be found necessary, contrary to expectation, for the Post Office to increase, in some small degree, the contract price for forwarding this mail, there ought to be no hesitation in incurring the additional expense to obtain so great an accommodation for so large a portion of the kingdom."

The following time-table of three years later (1825) shows the speed of the grand central mail route of the kingdom, by which all posts were timed, and affords at the same time a material for a contrast between the mail-coach system, at the time just before its highest development, and the "limited mail" of our own day:—

	Miles.	Hours.
London to Edinburgh	390	46
Edinburgh to Aberdeen	133½	15½
Aberdeen to Inverness	123½	16
Stoppages at Edinburgh and Aberdeen		2
Total	646½	79½

This was an average of a little over eight miles an hour throughout—less than one-fifth of the express railway average. As a proof that this time-table was adhered to, we find in the *Scots Magazine* for 1825, under date 8th May, the following paragraph:—“The direct mail from London reached the Post Office on Sunday afternoon at ten minutes past five, nearly an hour within its time, thus accomplishing the journey between London and Edinburgh in the short space of forty-five hours. The rapidity, ease, and safety with which communication can now be had with every part of Britain is one of the most striking improvements in modern times, and forms an amusing contrast to the delays, dangers, and difficulties, that within the recollection of many awaited the unfortunate traveller.”

A higher speed was, however, attained before the final overthrow of the mail-coach system. Thus we learn from statements prepared in 1835 and 1836, for the information of the authorities, that the mail between Liverpool and Preston travelled at the rate of 10 miles 5 furlongs per hour; between Carlisle and Glasgow at 10 miles 4 furlongs; between London and Devonport at 10 miles 3 furlongs; between London and Bristol, and between Gloucester and Carmarthen, at 10 miles 2 furlongs; between London and Holyhead, Birmingham, Liverpool, and Manchester, at 10 miles 1 furlong; and between Birmingham and

Sheffield, Pontefract and Leeds, London and Bath, York and Edinburgh, and London and Halifax, at 10 miles per hour. At the same time private enterprise carried on a successful competition with the Government in the conveyance of passengers, and many of the stage coaches even surpassed the mail coaches in speed.

From the time any road was macadamised, the speed of the coaches on that road was improved, and an average speed of about nine miles, including stoppages, was maintained. Mr. Lewins says, “The fastest coaches (known as the ‘crack coaches’ from this circumstance and also for being on the best roads) were those travelling, in 1836, between London and Shrewsbury, accomplishing 154 miles in 15 hours; London and Exeter, 171 miles in 17 hours; London and Manchester, 187 miles in 19 hours; and London and Holyhead, 261 miles in 27 hours.” It is stated in the Postmaster-General’s First Report, that, about the year 1818, Mr. Macadam’s improved system of road-making began to be of great service to the Post Office by enabling the mails to be much accelerated. “Their speed was gradually increased to ten miles an hour and even more, until, in the case of the Devonport mail, the journey of 216 miles, including stoppages, was punctually performed in twenty-one hours and fourteen minutes.”

STATE OF THE ROADS.

It must not be concluded, how-

ever, from these extracts, that road-making had reached its best possible development by the time when mail coaches were practically run off the road. The methods of Macadam and Telford were so great an improvement on what had gone before, that the completeness and smoothness of the English roads were the subject of constant approbation and praise. Here is what *advocatus diaboli* in the person of Mr. Hooper, in his report on the carriages in the Dublin Exhibition of 1865, has to say why Macadam and his roads should not have the honours of canonisation :—

“In England the roads are only half made or at least unfinished, and it is left to the feet of horses or the wheels of vehicles to crush together or compound the loose stones into a smooth mass as best they may. The result may be guessed ; this uncouth and rude treatment, although in the course of time it effects its object, leaves the road uneven with depressions that hold the water, and loose stones that obstinately refuse to mate with their fellows.

“In France the roads when prepared with the last surface-dressing of hard broken stones are treated so as to finish them fit for traffic. Fine gravel is thrown on the broken metal and slightly watered ; a smooth, wide, and heavy roller is then drawn over it till the surface is compact and smooth enough for ordinary traffic, saving horses much unnecessary toil and suffering, besides avoiding

the strain and injury to carriages and carriage wheels.”

They manage these things better in France !

This is, however, only of recent verity, and the better treatment of some of the roads in France may be looked upon as indeed an evidence of backwardness, and this on the same authority as that just quoted. Roads in Britain, though still of importance, are now almost purely local in their value, and the scanty traffic upon them scarcely requires the adoption of the expensive methods pointed out. The English mail-coach roads were the best of their day, and progress in improving them was stopped by the events which robbed them of their importance. In England the art of road-making has slumbered, while on the Continent, “foreign engineers have taken up the art where English engineers left it.”

Hence there is some point in what the same reporter wrote two years afterwards, when treating of the Paris Exhibition :—“The first great merits of the English mail coaches were their lightness, compactness, and the height of their wheels ; their weight was from one-half to two-thirds of the French diligences ; the interiors of both were very similar, except that the English usually carried four and the French six passengers. . . . The English coaches required good roads, and France had not such roads at the time referred to, and could not consequently have used English mail coaches even if she had possessed them.”

But if one of our countrymen is so severe on our coach roads and coaches, we may set against his opinion that of a travelled Frenchman who came over with Charles X. when that monarch went into exile after the second French Revolution. Barond'Haussez, in his *Great Britain in 1833*, says—

“The appointments of an English coach are no less elegant than its form. A portly good-looking coachman seated on a very high coach-box, well dressed, wearing white gloves, a nosegay in his button-hole, and his chin enveloped in an enormous cravat, drives four horses perfectly matched and harnessed, and as carefully groomed as when they excited admiration in the carriages of Grosvenor and Berkeley Squares. Such is the manner in which English horses are managed, such also is their docility, the effect either of temperament or training, that you do not remark the least restiveness in them. Four-horse coaches are to be seen rapidly traversing the most populous streets of London, without occasioning the least accident, without being at all inconvenienced in the midst of the numerous carriages, which hardly leave the necessary space to pass. The swearing of ostlers is never heard at the relays, any more than the neighing of horses; nor are you interrupted on the road by the voice of the coachman, or the sound of his whip, which differs only from a cabriolet whip in the length of the thong, and serves

more as a sort of appendage than a means of correction in the hand which carries it. In England, where everything is so well arranged, where each person knows so well how to confine himself to the exigencies of his proper position, the horses do better what they have to do than the horses of other countries, and that too without need of a brutal correction. One may travel from one end of England to the other without hearing the sound of a whip, or the hallooing of conductors, which in France fall so disagreeably on the ears of travellers.”

COST OF THE MAIL-COACH SYSTEM.

For the maintenance of the mail-coach system and its ramifications a considerable outlay of capital was necessary, and the cost of travelling by the mail was such that only the wealthy could indulge in it. The expense was, however, much less than that of travelling post, the best evidence of this being the considerable impetus to travelling given by the establishment of stage coaches and mail coaches.

The following estimate given by Wakefield in his *Account of Ireland*, of the actual running cost of one coach, that between London and York, may serve to illustrate this point :—

“To shew the nature of stage-coach business in England, I have made the following calculations of the expenses from tolerably good authorities, of a

stage-coach called the Highflyer, which ran from London to York :—

The number of horses kept for this coach is 166, each of which consumes four bushels of oats per week, making 83 qrs. at 30s.	£124 10s.
Also, 56 lbs. of hay per week, making 166 trusses, at £5 per load	23 15s.
	<hr/> £148 5s. <hr/>

Now if the above sum be multiplied by 52, we shall have for the annual expense	£7703 0s.
Eight coachmen, whose places are worth £100 per annum each	800 0s.
And five guards the same	500 0s.
Six coaches, four always on the road and two spare ones at each end of the journey, value £157:10s. each	£945
166 horses, valued at £30 each	4910
	<hr/> £5855 <hr/>

I calculate the wear and tear of carriages and the loss by horses at 20 per cent on the above amount. A set of wheels lasts only two months	£1184 0s.
Rent of stables for 166 horses, at 10s. a horse	83 0s.
Farriers for shoeing, and medicine for do., 40s.	332 0s.
I allow for horse-keepers, book-keepers, turnpike duty, wear and tear of harness, and incidental expenses	1398 0s.
	<hr/> £12,000 0s. <hr/>

This is the most moderate computation that can be made, nothing being allowed for the interest of money or the profit of the several proprietors.

These horses and carriages run from London to York daily, a distance of 400 miles, which being multiplied by 365 gives 146,000 miles at 1s. 8d. per mile, making 243,333½ shillings, or £12,166:13:4.

This estimate, as the writer observes, makes no allowance for interest on the capital or for profit to the owners; and with these added, it will be found that the cost of maintenance and the charges to the travellers were such as, at the value of money then

subsisting, to restrict travelling to a very limited class. Even in the years immediately preceding the railway era, the number of passengers by mail and stage coaches was only estimated at two millions per annum, which, in 1875, had been replaced by the five hundred million passengers conveyed by railway. In 1838, the cost to the country for conveying the mails by means of coaches amounted to £155,000 per annum; and basing his argument on this fact, and the relative weight of the mails carried twenty years later, a Post Office servant who was employed to review the remarks of Robert Stephenson, M.P., in his address as President of the Institute of Civil Engineers, alleges that without railways, penny postage would have been both practicable and remunerative, and that if the letters had increased as much as they did, the system might have been far more profitable than it had proved to be. There is much virtue in an "if," but the arguments of Mr. Page, the officer in question, are at all events ingenious, if not convincing. There can be no doubt that the railway system has proved much more costly than the mail coaches would ever likely have become, but if the extra speed had not been attained, the vast and previously incalculable increase in the number of letters could never have been witnessed.

In illustration of the fact that railway conveyance is more costly in one sense than mail-coach con-

veyance, a curious fact was stated by Lord Canning, in his First Report as Postmaster-General. This was, that in 1844, the Post Office received from the proprietors of a coach running between Lancaster and Carlisle a payment of about £200 a year for the *privilege* of carrying the mail twice a day between those cities, while eleven years later, that is at the time his lordship wrote, the sum of £12,000 a year was being paid to the railway for the same service.

This fact shows that the obligation to maintain time, the superior appointments, and the general excellence of the mail coaches, had given them a prestige which the rival coaches that did not secure the royal patronage did not enjoy. Even at this day, some of the few coaches and passenger vehicles plying in the remote districts of the kingdom, strive to enhance their value in the eyes of tourists by the announcement that they "carry her Majesty's mails."

THE COACH-BUILDING CONTRACT.

The splendid coaches, on which the royal arms were emblazoned, were built of one pattern from a period early in this century. The

contractors for horsing the mails were bound to take their coaches from the Government builder, for though the Post Office undertook that the building of the coaches should be done at its sight, the department only undertook the cost of cleaning, oiling, and greasing them, the latter expense amounting, it is stated by Mr. Lewins, to £2200 a year.

With regard to this method of supplying the mail coaches on one pattern and from one builder, it is related that a coach-builder, in the days of the old mail coaches made a fortune by contracting to supply government with mail coaches at a price so low that all competitors said he must be ruined. He knew, however, what he was about. In a coach, certain portions only wear out; and as he built all the mails on one model, when the old coaches were returned, he took out such parts as were not worn, and by their help turned out a new coach at 75 per cent of what it would otherwise have cost him. "That was a clever fellow," said a recent speaker, who narrated the anecdote, "and would have deserved a gold medal for a plan which tended to reduce the cost of carrying letters."



CHAPTER IV.

"The ghosts of mail coaches, and horses, guards, coachmen, and passengers were in the habit of making journeys regularly every night."—*The Story of the Bagman's Uncle*, PICKWICK, chap. xlix.

PERSONAL REMINISCENCES OF THE MAIL COACH—PLEASURES OF THE MAIL—MISERIES OF THE MAIL—THE OUTSIDE PASSENGER—THE "ROAD GAME"—THE MAIL-COACH DRIVER—THE MAIL-GUARD.

PERSONAL REMINISCENCES OF THE MAIL COACH.

IF one finds in Fielding and the other novelists of last century the best pictures of the modes of travelling and phases of life on the road in their day, our own time has produced, in Charles Dickens, one whose works are full of most interesting sketches of mail-coach life. The "Story of the Bagman's Uncle," from which a quotation graces the opening of this chapter, is but one of many such sketches scattered throughout the novels of Dickens, in which "mail coaches, and horses, guards, coachmen, and passengers" are made to repeat their journeys before our eyes, and to depict for our enlightenment the peculiar characteristics of a mode of progression now only existing in the recollections of elderly people, and which must soon cease to be an experience in living memories. The coaches amongst which the Bagman's uncle found himself on the night of his remarkable adventure are thus described :—

"The doors had been torn from their hinges and removed ; the linings had been stripped off, only a shred hanging here and there by a rusty nail ; the lamps were gone ; the poles had long since vanished ; the ironwork was rusty ; the paint worn away. They were the decayed skeletons of departed mails ;" and here the venerable relative of the narrator moralised after this fashion :—

"My uncle rested his head upon his hand, and thought of the busy bustling people who had rattled about in the old coaches, and were now as silent and changed ; he thought of the numbers of people to whom one of those crazy mouldering vehicles had borne, night after night, for many years and through all weathers, the anxiously expected intelligence, the eagerly looked for remittance, the promised assurance of health and safety, the sudden announcement of sickness and death. The merchant, the

lover, the wife, the widow, the mother, the schoolboy, the very child who tottered to the door at the postman's knock, how had they all looked forward to the arrival of the old coach; and where were they all now?"

Allusion has been made in preceding chapters to the bustle and activity which the main roads presented in those days, and the excitement which the passing post chaises, stage coaches, and mail coaches created in the towns and



ROCHESTER CASTLE FROM S.E. END OF BRIDGE.

villages through which they passed. This had early been remarked by a keen observer, and one who set himself to enjoy every pleasure that life could afford, Horace Walpole, who writes to one of his correspondents in 1795:—"Such a partiality have I for moving

objects, that in advertisements of country houses I have thought it a recommendation when there was an N.B. of *three stage coaches* pass by the door every day." To the mail coach, however, there came to be attached more importance and stir than to other conveyances.

The passage of a private carriage or post-chaise through the country villages was ever a source of interest, attracting the "gaping gaze" of the people, and enlisting a personal sympathy to which watching the passage of express trains, for example, could never give rise. In the case of the mail coach, its regularity and the knowledge that it came from the great centre of the nation, or at least was in immediate connection with another coach that ran to London, gave it an importance beyond all that private and occasional conveyances could obtain. The late Miss Martineau, in her *History of England during the Thirty Years' Peace*, has taken notice of this, and furnished some interesting illustrations. During the trial of the unfortunate Queen Caroline, for example, all along the line of the mails, "crowds stood waiting in the burning sunshine for news of the trial, which was shouted out to them as the coach passed." When the Reform Bill agitation was at its height, the mail roads were watched everywhere by persons anxious to obtain news of the progress of the measure, and the coachmen and guards on the top of the mail coaches shouted out the tidings. In the case of a ministerial crisis, it is stated that mail guards were in use to distribute hand-bills on their route, which were furnished to them in London for this purpose.

In the opposite way, the mail guard served as a means of communication with the rulers of the

kingdom at head quarters. In the days before railways and telegraphs, the postmasters in the country were required to send up all election intelligence by the speediest mode possible, a special despatch to the Post Office in London marked "by guard," being a recognised method. It was by this means that the results of a general election slowly reached the ministry in London, and no such rapid resignation of the ministry on hearing of the progress of the election as was witnessed in 1874 could then have been possible. In the event of any disturbance or anticipated rising, a despatch "by guard" would be sent by the local authorities, as the readiest means of apprising the Government of the day.

As with the stage coach, personal reminiscences or pictures of mail-coach travel divide themselves into three or four well-defined heads. There are the miseries and the pleasures of travelling, debates as to the relative merits of outside and inside places, pictures of the guards, the coachmen, the fellow-passengers, and lastly, in more recent writings, the discussion whether the traveller may not have lost something of real value by the more rapid but less picturesque mode of travelling by rail.

PLEASURES OF THE MAIL.

To the more buoyant traveller the mail coach was almost always a pleasure, especially if of the same mind as Mr. O'Doherty, from

whose "*Maxims*," published half a century ago in *Blackwood's Magazine*, the following may be given :—

"Maxim Forty-seventh.

"There are two methods of mail-coach travelling, the generous and the sparing. I have tried both, and give my voice decidedly for the former. It is all stuff that you hear about eating and drinking plentifully inducing fever, etc., during a long journey. Eating and drinking copiously produce nothing, mind and body being well regulated, but sleepiness, and I know no place where that inclination can be indulged less reprehensibly than in a mail-coach, for at least sixteen hours out of the twenty-four. In travelling I make it a point to eat whenever I can sit down, and to drink (ale) whenever the coach stops. As for the interim, when I can neither eat nor drink, I smoke if upon deck, and snuff if inside.

"*N.B.*—Of course I mean when there is no opportunity for flirtation.

"Maxim Forty-eighth.

"If you meet with a pleasant fellow in a stage coach, dine and get drunk with him, and, still holding him to be a pleasant fellow, hear from his own lips that he is a *Whig*, do not change your opinion of the man. Depend on it he is quizzing you."

The commercial gentleman

quoted in an earlier chapter, who from his appreciation of coach travelling might have been the "nephew of his uncle," or, in other words, the narrator of Dickens' story, discusses from the bagman's point of view the advantages of the coaches of 1837, in the following terms :—

"The best and cheapest and most convenient method of traversing the country is a question of frequent disputation among travellers. Some advocate gig, some coach travelling. Some still cherish the antiquated mode of the saddle, and even a few have an affectionate leaning towards the most primitive mode of conveyance, viz. that afforded by their own unassisted pedestals. The latter class is, however, nearly extinct, and in our pilgrimages we have only met with a solitary specimen of this thrifty and pains-taking class. He however seems endowed with ubiquity.

"We believe the following observations will be found correct, at any rate they are the result of observation.

"If you travel through a thinly populated district, such as the greater part of Scotland, where the trading-towns are few and far apart, travel by coach.

"If your trade is more directed to large towns, and if you remain a considerable time in each of these, travel by coach.

"If it be necessary to your business that you should be able to move *very* rapidly from one town to another, and if you are

compelled to visit the metropolis three or four times in the year, travel by coach.

"If, on the other hand, you purpose trading in each town you pass through, if your patterns are bulky, if you only progress through a certain district twice or three times a year, travel by gig.

"Each mode of travel has its pleasures and inconveniences. It is an old saying that when travelling by coach, you have either too much time or too little."

A good deal of the enjoyment of a seat in or on a mail coach of course depended on the casual incidents of the journey. The bustle and confusion of numbers of coaches arriving or departing at one time formed an attraction. Such a picture has been drawn by one who, having long occupied the box-seat from love of the "sport," was well versed in the various attractions of the road:—

"Having achieved the 'Peacock' at Islington, a sight only to be seen there and in those days awaits us. A noise, I will call it a 'sonus quadrupedans,' assails your ears as coach after coach comes up. All coaches going anywhere north called there, and as they came up, the old hostler, or a man, whoever he was, with a horn lantern, called out their names as they arrived on the scene. Up they come through the fog, but our old friend knows them all. Now 'York Highflyer,' now 'Leeds Union,' now 'York Express,' now 'Rockingham,' now 'Stamford Regent,' now 'Truth and Daylight,'

and others which I forget, all with their lamps lit, and all smoking and steaming, so that you could hardly see the horses. Off they go, one by one as they get their vacant places filled up, the guard on one playing 'Off she goes,' on another 'Oh dear! what can the matter be?' on another 'When from great Londonderry,' on another 'The flaxen-headed ploughboy,' in fact all playing different tunes almost at the same time. The coaches rattling over the stones, or rather pavement—for there was little or no macadam in those days; the horses' feet clattering along to the sound of the merry keyed bugles upon which many of the guards played remarkably well, altogether made such a noise as could be heard nowhere except at the 'Peacock,' at Islington at half-past six o'clock in the morning."

Thus far the *Reminiscences of a Gentleman Coachman*, while from the opposite end of the kingdom we borrow the following incident, in which the travellers in a mail coach from Edinburgh to Carlisle in 1821 assisted a runaway couple in achieving Gretna Green—a place the glories of which Lord Campbell so ruthlessly destroyed by Act of Parliament some twenty years ago:—

"I set out for Carlisle on the following morning, and met with no adventure worth mentioning, till we reached Gretna Green, 'of buckling celebrity.' Here, however, a little incident occurred which must always form a sort of era in my monotonous existence.

We had passed this notorious scene of renegade matrimony about a mile and a half, when we were met by a chaise and four, the horses all in a foam, the postillions whipping and spurring like the very devil, and a gentleman of very interesting and manly appearance on the box cheering them on to still greater exertions, and more unmerciful flagellations. They had cleared the winning-post (by which I mean the little river Sark, the boundary of the two kingdoms, and only at a little distance from Gretna), and it was now neck or nothing, for the pursuit had been conducted with such animation and perseverance, that the gallant had not started a minute and a half from the Bush Inn at Carlisle, when the father of the fair fugitive drove up to the door. Horses were shifted in less than three minutes, so that the advantage of time in favour of the fugitives might be estimated at less than five minutes. When we met the first chaise the race had reached the very *acmé* of interest. It was impossible to remain passive. Something *must* be done, and that instantly,—the pursuers were already in sight. In this extremity, and prompted by a spirit of sympathy, which I hope you have too much gallantry to condemn, I seized the reins from the hands of the coachman, and, with the aid of a spruce young blood, who entered into the joke *toto corde*, we instantly descended, turned the horses and coach right across the road, and

commenced fumbling among the traces, as if something had been broken and required immediate repair. I should mention that we chose our ground with considerable judgment, for, at the place where we set the coach across the road, it was so narrow, that to pass us with any reasonable degree of safety was an utter impossibility. In a trice the pursuers were at us, and a scene ensued which beggars all attempts at description,—roaring—imprecating curses—blows—confusion—blasphemy—entreaty—all commingled in strange wise, and all for a little to no purpose; for Old Crusty was in such a towering passion, and the postillions were in such a pother, that they did nothing but run about knocking their dunderheads against one another. During the *mêlée*, however, I thought I noticed that the postillions were by no means so hearty in the cause of the father as I had seen those who were in that of his daughter;—they made a world of noise, swore dreadfully unprofitable oaths,—ran about yelling like drunken demons,—but did—nothing. At length after delaying them for about eight minutes, we got our ponderous vehicle turned once more in the line of march, and off we set, accompanied by a volley of oaths, which, ‘could curses kill,’ would be no joke, I assure. Our interference, however, had done the gallant good service, for before the father and his myrmidons arrived at ‘Johnson’s Tavern,’

(the Temple of Hymen at Gretna), the *priest*, always on the alert, and the law of Scotland ever kind to lovers in haste, had rendered all further efforts on the part of the father to recover his fugitive child perfectly fruitless ;—she had become—a wife !

“On the evening of the same day the young *married* couple returned to the Bush, Carlisle, where, just as they were descending from their chaise, now no longer alarmed by the dread of being overtaken, the coachman who had so properly and prudently suffered himself to be disposed by myself and the other gentlemen, and had thereby done them so seasonable service, approached the gallant, and begged his honour’s pleasure in consideration of his signal merit in delaying the pursuit for these all-important eight minutes ; explaining, at the same time, with the accustomed veracity of his trade, that he had done the deed of his own proper motion, and at his own personal risk. A couple of sovereigns rewarded his application. I happened to pass at the same instant on my way to the White Hart, one of the best houses of entertainment in England. I do not know what process had been elaborated in coachee’s mind by the reception of the two sovereigns which he had just secured, by claiming to himself the whole merit of the transaction, but he had hardly noticed me, ere he vociferated, “Gadzooks, your honour, if that be’s not the very gentleman who coomed to ma

help joost at the nick o’ tyme, your honour, and gammoned ould camstary like a very knowing one.” Benedict was at me in a trice, and begged that I would do him the honour to drink a glass of wine with him and his bride. . . I thought I should have been devoured with thanks from both the parties when I related to them the true state of the adventure on the banks of the Sark, prompted by the impulse of the moment and the perilous aspect of the chase. But for this seasonable device they must infallibly have been caught, and what would have rendered such a calamity still more dreadful, they would have been arrested at the very moment and spot where they expected to consummate their fondest hopes. Indeed, this must have happened in an earlier part of the run, had not the postillions been previously determined against such a chance. These knowing rogues are afraid of throwing discredit on the road to Gretna ; and although they like the chase, they have no notion of running down the game. Besides, it almost always happens that the gallant pays most liberally, and no class of men exemplify so strikingly the omnipotence of gold. Happening to express my surprise to our postillion, a Yorkshireman, that the father was so seldom successful in recovering his child, ‘Doesn’t know, measter,’ said coachee, with a mixture of contempt for my ignorance, and indignation at the very idea of a father succeeding in such an attempt, ‘Doesn’t

know, that yae half soovereign could na, by no possibility in this oorld, e'er catch two *whole* ones'?"

MISERIES OF THE MAIL.

The miseries of mail-coach travelling were partly personal to those who endured them, that is created by their own determination to make much complaint out of little, and partly proper to the coach itself, or to the bad roads. The road from Edinburgh to Berwick was in very bad order at the beginning of the present century, and at one part of it, more particularly, there was a mile or two so ruinous that passengers were in terror of their lives, from risk of the coach being overturned or the horses stumbling. The progress of road-improvement necessarily lessened, though it did not wholly abate, mail-coach accidents, but there were dangers of fogs and floods against which almost no improvement of the roads offered a safeguard, while skilful handling of the team or excellence in the build of the vehicles could scarcely give any better protection. The following incident, from the *Edinburgh Evening Courant* in the last months of the eighteenth century is of interest because of the curious remark at the end on the influence of high price of corn in creating delay of the mails. What would have been said had our railway companies quoted the "high price of coals"—an event on whose shoulders much was laid for a year or two—and made that an excuse

for the want of speed or punctuality in the trains during 1873 and 1874?

"There was a remarkably thick fog through the whole of Monday night generally, for sixty or eighty miles round the metropolis if not farther. The Liverpool mail coach was drawn up a bank, and had not the horses turned round, must have been overturned; the Exeter mail going out was overturned, by driving out of the road, as was the Poole. The fog was so great that the large patent lamps were not of the least use. The Portsmouth mail took leading horses and a post-boy at every stage, as did many of the mails, by which they escaped upsets." . . . "The fog added yesterday morning to the late arrival of mail coaches, which, from bad roads and weak horses, while corn is so dear, may be expected."

The following incident, besides illustrating an actual danger in mail-coach travelling, is best deserving of preservation because of the curious legal phrase introduced in the verdict of the coroner's jury:—"On 16th June 1821, a most melancholy and distressing accident took place at Sunderland Bridge, between Durham and Kuseyford. As the mail coach from Edinburgh to London was turning the corner of the bridge, it was unfortunately overturned against the battlement, when Mr. Donaldson, a cattle-dealer near Perth, and Mr. Whitaker, an architect, two outside passengers, were thrown over the bridge, and falling upon

a weir or buttress, a depth of many feet, Mr. Donaldson was killed on the spot, and Mr. Whitaker was so much hurt that he died at ten o'clock the same evening. Mr. Chater, who was sitting on the seat with the driver, escaped unhurt, and the guard, driver, and three inside passengers also escaped without injury. A coroner's jury sat on the bodies, and brought in a verdict of manslaughter, caused by furious driving, against the coachman, and made a nominal deodand upon the coach and horse." The driver was tried at the ensuing assizes and sentenced to nine months' imprisonment. At York assizes, of the same date, a gentleman obtained damages of £200 from the owners of the Glasgow Mail, for having his leg broken in two places by the upsetting of the mail by negligent driving.

This phrase "deodand" was one very familiar to newspaper readers up till the abolition of the law about thirty years ago. By the law of England (as by that of most other nations) a personal chattel which was the immediate and accidental occasion of the death of a reasonable creature, was forfeited to the crown in order that it might be applied to pious uses, or "given to God," as the phrase implies. Blackstone believed the custom to have arisen from the intention to devote the proceeds to prayers for the souls of those snatched away by sudden death; in the same way that the apparel of a stranger found dead

was applied to purchase masses for the good of his soul. On the other hand, it is suggested that the practice arose from natural horror felt towards the cause of so dreadful an occurrence as death; and in support of this view the old Jewish law that an ox which has gored a man to death should be stoned, and its flesh should not be eaten, is quoted, and also the law in England, that a well in which any one has been drowned should be filled up. Be the origin and purpose what it may, the law of deodand fell into that condition which is the sure precursor of abolition, for instead of forfeiture a certain sum in money was declared by way of deodand against the offending article. If we mistake not, the abolition of the law was finally brought about when the difficulty of applying it to railway accidents was found. This makes the illustration of the practice in the present connection both appropriate and interesting.

"Coach full inside and out" was an accidental "misery" of travelling of which the present generation has no conception, with trains travelling, as a rule, about two-thirds short of their full complement of occupants. As "he best can paint them who has felt them most," we shall allow the commercial gentleman already quoted to speak on this point:—

"Among the miseries of commercial life we may instance the one of rising at three o'clock on an inclement winter morning, or

haply sitting up till that time in a cold solitary bar, amid the perfumes of expiring candles. In the one case, you are rudely disturbed from your first slumber by a "boots," rendered ferocious by his own sense of the hardship; dress yourself by the aid of a taper, which each gust through the ill-fitting window threatens to extinguish, and then groping your way to the cheerless room below, await in shivering durance the arrival of the coach. In some half-hour you hear the faint wail of the guard's horn, mingling its tones with the still louder tempest. Then you are aware of the fresh horses slowly trailing down the gateway. Having wound yourself up to a desperate effort, you rush out, and when half recovered from the first blinding gust of sleet and rain, you have the satisfaction of finding the coach full inside and out. You then retire to your room with a pleasing sense of the utility of your efforts, and indulge in the agreeable certainty of having to pay for a chaise and pair a few hours later in the morning."

Leigh Hunt has given, in his papers in the *Indicator*, some lively pictures of travel, and all he has to say on the subject of mail coaches may, curiously enough, be embraced under the head of the "miseries" of that form of conveyance. One great annoyance—that of being "done" out of the best seat by an astute but smooth-speaking fellow-traveller—he has described in his usual genial way:—

"A very troublesome degree

of science is necessary for being well settled in the coach. We remember travelling in our youth, upon the north road, with an orthodox elderly gentleman of very venerable peruke, who talked much and won our inexperienced heart with a notion that he was deep in Horace and Virgil. He was much deeper in his wig. Towards evening as he seemed restless, we asked with much diffidence whether a change even for the worse might not relieve him; for we were riding backwards and thought all elderly people disliked that way. He insinuated the very objection, so we recoiled from asking him again. In a minute or two, however, he insisted that we were uneasy ourselves, and that he must relieve us for our own sake. We protested as filially as possible against this; but at last, out of mere shame of disputing the point with so benevolent an elder, we changed seats with him. After an interval of placid meditation, *we found the evening sun full in our face*. His new comfort set him dozing, and every now and then he jerked his wig in our eyes, till we had the pleasure to see him take out a night-cap and look extremely ghastly. The same person and his serious young companion tricked us out of a good bed we happened to get at the inn."

The description of this journey would seem to have been written at once, and under the influence of the time, for as night approaches, and the disadvantages force them-

selves more and more into notice, the tone becomes even more querulous:—

“The greatest peculiarity attending a mail coach,” he says, “arises from its travelling at night. The gradual decline of talk, the incipient snore, the rustling and alteration of legs and nightcaps, the cessation of other noises on the road, the sound of the wind or rain, of the moist circuit of the wheels, and of the time-beating tread of the horses, all dispose the traveller who cannot sleep to a double sense of the little that is left him to observe. The coach stops, the door opens; a rush of cold air announces at once the demands and the merits of the guard who is taking his leave and is anxious to remember us. The door is clapped to again; the sound of everything outside becomes dim; and voices are heard knocking up the people of the inn, and answered by issuing yawns and excuses. Wooden shoes clog heavily about. The horses’ mouths are heard swilling up the water out of the tubs. All is still again; and some one in the coach takes a long breath. The driver mounts, and we resume our way. It happens that we can sleep anywhere except in a mail coach; so that we hate to see a prudent warm old fellow, who has been eating our fowls and intercepting our toast, put on his nightcap in order to settle himself till the morning. We rejoice in the digs that his neighbour’s elbow

gives him, and hail the long-legged traveller that sits opposite. A passenger of our wakeful description must try to content himself with listening to the sounds above mentioned, or thinking of his friends; or turning verses, as Sir Richard Blackmore did, ‘to the rumbling of his coach’s wheels,’ or chatting with the servant-girl who is going to place, or protecting her against the Methodist in the corner; or, if alone with her, and she has a kind face, protecting her against a much more difficult person—himself.”

Thomas De Quincy has left on record, in his interesting essay on *Travelling*, a picture of a form of misery peculiar to the midland towns, where the night coaches, starting timeously enough from the extreme points of their journey, frequently presented themselves at uncomfortable hours of the night. The description refers to what the writer designates as “gloomy, noisy, and at that time dirty, Birmingham” :—

“There are, I can well believe, thousands to whom Birmingham is another name for domestic peace, and for a reasonable share in sunshine. But in my case, who have passed through Birmingham a hundred times, it always happened to rain except once; and that once the Shrewsbury mail carried me so rapidly away that I had not time to examine the sunshine, or see whether it might not be some gilt Birmingham counterfeit; for you know, men of Birmingham,

that you *can* counterfeit—such is your cleverness—all things in Heaven and earth, from Jove's thunderbolts down to a tailor's bodkin. Therefore the gloom is to be charged to my bad luck. Then as to the noise, never did I sleep at that enormous *Hen and Chickens* to which usually my destiny brought me, but I had reason to complain that the discreet hen did not gather her vagrant flock to roost at less variable hours. Till two or three I was kept waking by those who were retiring, and about three commenced the morning functions of the porter or 'Boots,' or of 'Underboots,' who began their rounds by collecting the several freights for the High-flyer or the Tally-ho, or the Bang-up, to all points of the compass, and too often (as must happen in such immense establishments) thundered into my room with that appalling 'Now, sir, the horses are coming out.' So that rarely indeed have I happened to *sleep* in Birmingham."

Dean Ramsay has preserved for us an anecdote which shows that not only the road between Edinburgh and Berwick, referred to in a previous paragraph, but the vehicles running over the road, sometimes gave rise to inconvenience to the unfortunate passengers:—

"A gentleman sitting in the stage coach at Berwick complained bitterly that the cushion on which he sat was quite wet. On looking up to the roof he saw a hole through which the rain descended

copiously, and at once accounted for the mischief. He called for the coachman, and in great wrath reproached him with the evil under which he suffered, and pointed to the hole which was the cause of it. All the satisfaction, however, that he got was the quiet unmoved reply, 'Ay, mony a ane has complained o' *that* hole.'

To show that travelling, like misfortunes, may make us acquainted with strange bed-fellows, and at the same time to sketch a phase of social life—that of the State lotteries—now happily as far departed into the unknown as mail-coach travelling itself,—the *Recollections of Julian Young* furnish an interesting anecdote of Theodore Hook. He went by coach to Sudbourne, and inside the coach he met a brown-faced melancholy-looking man with an expression of great querulousness, quite in character with his conversation, which was one of ceaseless complaining. "Sir," said he, "you may have known unfortunate men possibly in your day—you may, for aught I know, be an unfortunate man yourself,—but I do not believe there is such another unfortunate man as I am in the whole world. 'Twas but the other day that I thought I would buy a ticket in the lottery. I did so, stupid ass as I was, and took a sixteenth. Sir, I had no sooner bought it than I repented of my folly, and feeling convinced that it would be a blank I got rid of it to a friend, who I knew would thank me for the favour,

and at the same time save me from another disappointment. Sir, would you believe it? I know you won't; but it is true,—it turned up £30,000." "What?" said Hook, "it is incredible. If it had happened to me I should certainly have cut my throat." "Well," said he, "of course you would, and so did I;" and baring his neck, he exposed to Hook's horror-stricken gaze a freshly-healed cicatrix from ear to ear.

Most of the preceding incidents have reference to inside passengers, and as a midway passage to the consideration of the pleasures or advantages of an outside place on the mail, we may insert the anecdote of what once happened to an Edinburgh gentleman, large as "the Claimant" who was in use to book *two* inside places for himself when he travelled by the mail. Sending his servant one day to book him double as usual for Glasgow, the servant returned with the intelligence:—"There were not two inside places left, so I have booked you one inside and one outside!" And here too may be quoted one of the accidents—not in the destructive sense—of mail-coach travelling, namely, its aspect to those who are progressing by slower means, so charmingly depicted by the great modern master of social observation, in his description of the waggon journey of "Little Nell":—

"The waking from a sound nap as the mail came dashing past like a highway comet, with gleaming

lamps, and rattling hoofs, and visions of a guard behind standing up to keep his feet warm, and of a gentleman in a fur cap opening his eyes and looking wild and stupified—the stopping at the turnpike when the man was gone to bed, and knocking at the door until he answered with a smothered shout from under the bed-clothes in the little room above, where the faint light was burning, and presently came down, night-capped and shivering, to throw the gate wide open and wish all waggons off the road except by day. The cold, sharp interval between night and morning—the distant streak of light widening and spreading—the presence of day with its cheerfulness and life . . . the night coach changing horses—the passengers cheerless, cold, ugly, and discontented with three months' growth of hair in one night—the coachman fresh as from a band-box, and exquisitely beautiful by contrast,—so much bustle, so many things in motion, such a variety of incidents—when was there such a journey with so many delights?"

THE OUTSIDE PASSENGER.

"The great difference between the English mail coach and the French diligence," says Mr. Hooper, "was the number of outside passengers carried on the English system. The English have a delight in fresh air, and much prefer to breathe the pure air than to be enclosed with a number of

other persons, by which the air must necessarily become impure.

"Women were generally conveyed in the inside except in fine weather, when they frequently occupied outside seats, being helped up and down with convenient ladders kept at the post-houses for the purpose. In cold or bad weather, the outside passengers were well supplied with thick coats and wrappers, and protected from the rain with umbrellas. At the inns and hotels on the road, comfortable breakfasts, dinners, teas, and suppers, were provided the moment the coach stopped at its appointed place of refreshment."

Frenchmen did not understand this feature of the English character, and here is what Baron d'Haussez wrote on the inexplicable preference for an outside seat:—"The desire to breathe the fresh air, rather than economical considerations, induces even the richest English to give a preference to outside places. They only go inside when compelled by bad weather. The place most in request—one knows not wherefore—is to the left of the coachman; it is considered as the place of honour, and is reserved for fashionables, and even for lords, who do not disdain to travel thus. The sole advantages which such a station appeared to me to present were, the being placed near a well-dressed coachman, and the escaping the chance of travelling by the side of a butcher, a shoemaker, or some other individual of that class. Each time the coachman descends

from his box, his neighbour has the advantage of being made the forced depository of his reins and whip. These are placed in your hands, as they are taken out of them again, without the least ceremony."

There was a time when outside travelling was perhaps not deemed respectable; the feeling indicated by the Lutheran clergyman Mr. Moritz, quoted in a previous chapter, being not altogether removed, even when outside travelling became less dangerous than he depicted it. Of this feeling Galt has preserved a memory in the *Ayrshire Legatees*, where the clerical hero, journeying to London, says:—

"I was obligated to mount aloft on the outside. I had some scruple of conscience about this, for I was afraid of my decorum [as a clergyman]. I met, however, with nothing but the height of discretion from the other outside passengers, although I jealoused that one of them was a light woman. . . But it's extraordinary what a power of drink the coachmen drink, stopping and going into every change-house, and yet behaving themselves with the greatest sobriety. . . When we had got to the outskirts of London, *I began to be ashamed of the sin of high places*, and would gladly have got into the inside of the coach."

De Quincey, in showing that outside travelling continually gained ground with the wealthier classes, has pointed to the decay of the feeling referred to, while he at the

same time protests that even to his day "so much influence survives from the original aristocratic principle upon which public carriages were constructed, that on the mail coaches there still prevails the most scandalous inattention to the comfort, and even to the security, of the outside passengers : a slippery glazed roof frequently makes the sitting a matter of effort and anxiety, whilst the little iron side-rail of four inches in height serves to no purpose but that of bruising the thigh." In the writings of Dickens there are to be found numerous pictures of mail-coach life, and he fully appreciated both the joyousness and the discomforts of the outside place. In the *Pickwick Papers*, in describing the Bath coach of 1827, he says:—

"The outsides did as outsides always do. They were very cheerful and talkative at the beginning of every stage, and very dismal and sleepy in the middle, and very bright and wakeful again towards the end. . . . There was a third young man on the box who wished to be learned in cattle, and an old one behind who was familiar with farming. There was a constant succession of Christian names in smock-frocks and white coats who were invited to have a 'lift' by the guard, and who knew every horse and hostler on the road and off it ; and there was a dinner which would have been cheap at half a crown a mouth, if any moderate number of mouths could have eaten it in the time." The tedium and fatigue of the outside place, especially to

the little victims who were on the way to Dotheboys Hall, are admirably described in *Nicholas Nickleby*, and almost the only act of the redoubtable Squeers in which one is moved to the slightest sympathy is his frequent descent from the coach to "stretch his legs," even if the stretching had the curious effect depicted by the author.

The outside place had acknowledged pleasures, and by no one have they been described with more sprightliness than by Albert Smith, in narrating his student adventures on the French diligences *en route* for Mont Blanc—these vehicles thus furnishing some of the best illustrations extant, on that point where, as stated by Mr. Hooper, they fall farthest short of the famous mail coaches of Great Britain. To understand the difference between the two vehicles, it may be noticed that while the mail coach was restricted to four inside, and carried ten or twelve passengers outside, the diligence carried to their destination eighteen travellers—three in the *coupé*, six in the *l'intérieure*, six in the *rotonde*, and three upon the imperial, or *banquette* as it was sometimes called.

"The beginning of the journey was not lively. It poured with rain, which beat into the *banquette* and compelled us to keep the black curtains closed." The Frenchman's dislike of outside travelling pure and simple is here illustrated by the fact that the single outside seat had black curtains. These

were hung from the tilt or covering, which protected the luggage on the roof from the bad weather of *La Belle France*. The bad weather lasted till Albert Smith and his companion got to Melun, where the diligence stopped for lunch.

"We took advantage of the halt to run about the town and look at the place, making our meal, when we started again, from our stores, in addition to some pears and a 'brick' of bread more than two feet long bought in the town. The passengers paid three francs each for their *déjeuner*: ours did not cost ten sous. At Montereau, at the junction of the Seine and Yonne, we got down at the *relai* and ran on, by which means we saw in the market-place some criminals exposed on a platform, with their names and crimes inscribed over their heads. None of the other passengers saw this exhibition; indeed it was curious to notice that two English people in the *coupé* drew down the blinds on account of the sun, and when they did not do this they were asleep. . . . As night came on, we crept under the tarpaulin roof of the diligence, stacked all the luggage on each side, collected all the straw, and slept at full length tolerably well. . . . We stopped at Dôle to breakfast and also to change diligences, where we found a little *café*, the landlord of which was very civil, and showed us all about the town, after we had washed at the fountain in the market-place, to the great delight

of a party of girls, who lent us a huge bit of soap and some towels. We never saw so many pretty girls as at this Dôle, nor so many wooden shoes,—in fact nobody appeared anxious to sell anything else, whatever kind of shop they kept. We bought a bottle of wine for threepence. When we got back to the hotel we saw the two *coupé* passengers awake for the first time. One of them complained of having been charged three francs and a half for a fowl which must have been roasted over and over again, and some questionable fish. We recommended him to buy a pie, but he said he did not like to,—it looked so. Then they wanted to see the Public Walk, with a view of the Alps and the Cathedral and other things we told them of; but just then the order was given to take their places, so we still appeared to be the gainers. The new diligence had a perfect paradise of *banquettes*—very large indeed, with no seat, but full of straw, so that we could lie down at full length, with our heads out in front. . . . From Les Rousses we began to descend. The road is beautifully hard and smooth, winding in all directions, with little stones all the way to mark it from the precipice. A sudden turn of the road brought to sight the famous view described by Rousseau and so often quoted. The whole lake of Geneva, beautifully blue, could be seen many hundred feet below us, with the Alps on the other side, their summits only showing above the

clouds ; and the country, like a coloured map at our feet. The passengers in the *intérieure* saw nothing of this, one of their windows looking against the mountain, and the other down the precipice ; in the *rotonde* they could only look out behind them as through the door of an omnibus ; and in the *coupé* they had pulled the blinds down, because the morning sun shone right through the windows : so we had the best of it again. . . . After dinner we saw to our passports ourselves, in preference to paying a commissioner, watched the sun set on Mont Blanc—a glorious sight, which the other passengers lost, as they were just then at the table d'hôte of the expensive Hôtel des Bergues—and then went to bed at seven, sheets and blankets proving quite a novelty. When we settled our accounts at night, we found our expenses of travelling and feeding came to about a quarter of what they would have been had we gone in the *coupé* and lived conventionally."

There is more in this than the mere advantage of outside travel, and we have thought it of interest to reproduce the many delicate touches of observation displayed in the brief extracts given. The advice Albert Smith gave on another page showed the proper spirit for a traveller, that inasmuch as trivial annoyances of every description will be constantly starting up, while, if temper be lost, they become ten times worse, "a firm resolve should be

taken to laugh at everything, with the certainty that, however vexatious the occurrence may be at the time, it will only serve to talk about the more merrily when you get home again."

"In fine weather," says Mr. Dodd, in his *Railways, Steamers, and Telegraphs*, "there was real enjoyment in sitting behind the four spirited horses, which, in their compact and well-kept harness, trotted along the road at a speed varying from seven to ten miles an hour. For the leisurely traveller the top of a stage coach presented advantages for viewing scenery which constitute no part of railway accommodation. There was time to discuss the merits of a ruin or a landscape ; the appearance and disappearance of one and the other was not then, or now, almost simultaneous : and conversation could be carried on with a chance of its being heard. Then there was variety in the road itself ; now traversing a well-cultivated vale, curving in and out among pastures and corn-fields, at times pleasantly overshadowed by trees ; anon rising over a hill, descending into a valley, skirting or crossing a running stream, penetrating at times the most picturesque parts of the land ; going through—not past—towns and villages where people ran to their doors and windows to see the vehicle speed by, and gazed after it with a feeling of pride so long as it remained in view. The traveller then could make himself acquainted with much that was interesting along

his line of route, and carry away a definite impression of the scenes which had passed before his eyes."

THE ROAD GAME.

There were other ways, too, in which the outside passenger could relieve the tedium of his journey.

The wished occasion by the hand he takes,
Some circumstances finds, but more he makes.

An example of this is furnished in the "Road Game," which was played to while away the time, and is explained by Mr. C. T. S. Birch Reynardson, the "gentleman coachman," in his recent work entitled *Down the Road*,—a book filled with very curious reminiscences of the later coaching days, and from whom we have already borrowed an incident or two. If incidents on the journey were wanting, this game was played, the coachman and a box-seat passenger playing and tossing for sides of the road. "A donkey counted seven, a pig one, a black sheep one, a cat five, a cat in a window ten, a dog one, a magpie one, a gray horse five," and so the game proceeded.

Mr. Williams, in *Our Iron Roads*, a history of those railways by which they were superseded, furnishes the "swan song" of the coaching days:—

"Many are there who still talk of the delights of travelling in the coaching days of old. They like to recall to mind the memories of the pleasant summer days they

spent on the box-seat, chatting with the burly coachman; who, well protected against the possibilities of the weather by innumerable coats, knew every man and every horse he met, and could tell all the news of the country round.

"They describe in glowing terms the manner in which the mail was taken each morning or evening in the year to the authorised inspector, who examined every inch from the pole to the hind boot, and who critically probed and tested the wheels, axles, linch-pins, springs, and glasses; how scrupulously every part was cleaned, and how every horse was groomed with as much precision as if he belonged to the stud of a nobleman. We perhaps smile at their enthusiasm, but admit that there is much reason for it, when the scenes thus delineated are connected with many a pleasing association. At eight o'clock P.M., the coach was in all the 'pride and panoply' of authority, with its mettled steeds 'in parade,' in Lombard Street, waiting to receive its bags; or, perhaps, it was one of these special occasions in which all ordinary circumstances were surpassed. The tidings of a victory had been received, a national foe had been defeated, and the mail was about to convey the intelligence to a thousand homes. Instead of the news being quietly spread over the length and breadth of the land in a few seconds, as in our own day, resort was had to more ordinary means. Horses,

men, and carriages were accordingly dressed in laurels and flowers, oak-leaves and ribbons; coachmen and guards displayed the royal livery to the best advantage around their rotund forms; passengers merged the reserve of their individuality in a stronger feeling of national exultation; and when the loud noise of the lids locked down on the mail bags smote on the ear, the trampling of fiery steeds was heard as they bounded off like leopards, amidst the thundering of wheels and the boisterous shouts of assembled hosts of observers. In the vivid remembrance of such scenes, it is scarcely surprising that some should regret that they have passed away for ever, that tidings must now be transmitted by steam or electric telegraph, and that the voice of the trumpet that once announced from afar the approach of the laurelled mail should be lost amid the hisses or shrieks of the locomotive. We can almost join with them when they sing:—

‘We miss the cantering team, the winding way,
The roadside halt, the post-horn’s well-known air,
The inns, the gaping towns, and all the landscape fair.’

“Now and then, indeed, we may meet with ‘a relic,’ who utterly despises the present means of locomotion, in contrast with the peculiar advantages which, he affirms, were enjoyed under the coaching system. He tells us, with a sneer, that now we don’t

travel, but are transferred from one part of the country to another; a satire which seems of the same order as that which was embodied in the sentiment of a venerable gentleman, who once bitterly exclaimed to a young acquaintance who had passed through a dental operation, ‘Draw teeth, indeed! They never draw them now-a-days. When I was a boy, they used to draw your teeth, and draw you all round the room too!’”

THE MAIL-COACH DRIVER.

Few things are more true than that two distinct species of the *genus homo* have been extinguished within the memory of the existing generation, in the disappearance of the mail-coach driver and the mail guard. They were the true outside passengers—the constant occupants in sun or rain, in wind or snow, in floods or in dust storms, of the chief seats upon the coach, and no sketch of the old *régime* would be complete, without special notice being taken of them. There were coach-drivers before Palmer’s time, but it was the improvement of the roads, and the increased attractiveness of the outside seats on the mail, that made the driver the great character he became. The mail guard was distinctly born of the Palmer system, so that both coachman and guard may be said to have risen and fallen with that system. The driver, prior to that time, had no personal history, no place in literature such as he subsequently obtained. And his suc-

cessor, the engine-driver of the day, though in his way a public character of no ordinary interest, entirely lacks that personality which was the mainspring of the coachman's fame. The latter lived to some extent with his life and the lives of the passengers in his hands, and a strong nerve, a wary eye, and a firm hand were often called into requisition to save—not always successfully—his charge from disaster. But he did not live under a constant strain, watching signals, or peering out into the darkness lest some unexpected obstruction should hurl his engine and train to instant destruction. When the sky was bright, the road in prime condition, and his gallant team in good fettle, the coachman bowled along with an *abandon* to which his successor on the iron horse is a stranger, and made for himself that name for skill, kindness, joviality, and general attractiveness which must ever be associated with the history of the mail coach.

From the *Sketch Book* of Washington Irving we give the following picture of this bygone character—a picture which, as the writer observes, “may serve as a general representation of this very numerous and important class of functionaries, who have a dress, a manner, a language, an air, peculiar to themselves, and prevalent throughout the fraternity; so that, wherever an English stage coachman may be seen, he cannot be mistaken for one of any other craft or mystery.”

P

“He has commonly a broad, full face, curiously mottled with red, as if the blood had been forced by hard feeding into every vessel of the skin; he is swelled into jolly dimensions by frequent potations of malt liquors, and his bulk is still further increased by a multiplicity of coats, in which he is buried like a cauliflower, the upper one reaching to his heels. He wears a broad-brimmed low-crowned hat; a huge roll of coloured handkerchief about his neck, knowingly knotted and tucked in at the bosom; and has in summer time a large bouquet of flowers in his button-hole; the present, most probably, of some enamoured country lass. His waistcoat is commonly of some bright colour, striped, and his small-clothes extend far below the knees, to meet a pair of jockey-boots which reach about half-way up his legs.

“All this costume is maintained with much precision; he has a pride in having his clothes of excellent materials; and, notwithstanding the seeming grossness of his appearance, there is still discernible that neatness and propriety of person which is almost inherent in an Englishman. He enjoys great consequence and consideration along the road; has frequent conferences with the village housewives, who look upon him as a man of great trust and dependence; and he seems to have a good understanding with every bright-eyed country lass. The moment he arrives where the

horses are to be changed, he throws down the reins with something of an air, and abandons the cattle to the care of the ostler; his duty being merely to drive from one stage to another. When off the box, his hands are thrust into the pockets of his great-coat, and he rolls about the inn-yard with an air of the most absolute lordliness. Here he is generally surrounded by an admiring throng of ostlers, stable-boys, shoeblacks, and those nameless hangers-on that infest inns and taverns, and run errands, and do all kinds of odd jobs, for the privilege of battenning on the drippings of the kitchen and the leakage of the taproom. These all look up to him as to an oracle; treasure up his cant phrases; echo his opinions about horses and other topics of jockey lore; and above all, endeavour to imitate his air and carriage. Every ragamuffin that has a coat to his back thrusts his hands in the pockets, rolls in his gait, talks slang, and is an embryo Coachey.

"Perhaps it might be owing to the pleasing serenity that reigned in my own mind, that I fancied I saw cheerfulness in every countenance throughout the journey. A stage coach, however, carries animation always with it, and puts the world in motion as it whirls along. The horn sounded at the entrance of a village produces a general bustle. Some hasten forth to meet friends, some with bundles and bandboxes to secure places, and in the hurry of the moment can hardly take leave of the group

that accompanies them. In the meantime the coachman has a world of small commissions to execute. Sometimes he delivers a hare or pheasant; sometimes jerks a small parcel or newspaper to the door of a public-house; and sometimes, with knowing leer and words of sly import, hands to some half-blushing, half-laughing housemaid an odd-shaped billet-doux from some rustic admirer. As the coach rattles through the village, every one runs to the window, and you have glances on every side of fresh country faces and blooming giggling girls. At the corners are assembled juntos of village idlers and wise men, who take their stations there for the important purpose of seeing company pass; but the sagest knot is generally at the blacksmith's, to whom the passing of the coach is an event fruitful of much speculation. The smith, with the horse's heel in his lap, pauses as the vehicle whirls by; the cyclops round the anvil suspend their ringing hammers, and suffer the iron to grow cool; and the sooty spectre in brown paper cap, labouring at the bellows, leans on the handle for a moment, and permits the asthmatic engine to heave a long-drawn sigh, while he glares through the murky smoke and sulphureous gleams of the smithy."

Mr. Hooper, descanting, from a professional point of view, on the disappearance of public coaches, says:—"The mail or stage coachman of the olden time was

the 'life of the road.' He was almost invariably a hearty, cheerful fellow, full of anecdote, fond of a chat, proud of his coach and of his horses, and willing to impart information to travellers as to any object of interest on the road. He frequently owned a share in the coach and horses he drove, was an 'artist' in his craft, managed his high-mettled team with great skill and courage, was full of resources in case of accidents, and was a sort of father to timid, nervous, and young persons when placed under his care. His skill was such that he would drive over a line of small coins placed along the road without missing one of them. The seat next to him was considered the 'seat of honour,' frequently reserved several days beforehand by gentlemen who wished to render their journey agreeable. He was, in addition, a professor of his art, and many were the noblemen and gentlemen who learned the art of driving four horses under his tuition, and handsomely rewarded him for teaching them."

Leigh Hunt, whose view of a mail-coach journey is not a little tinged with the querulousness engendered by the smaller miseries of travelling, has, however, a genial word for "coachey." He says:—

"The mail or stage coachman upon the whole is no inhuman mass of great-coat, gruffness, civility, and old boots. The latter is the politer from the smaller range of acquaintance, and his necessity for preserving them.

His face is red, and his voice rough, by the same process of drink and catarrh. He has a silver watch with a steel chain, and plenty of loose silver in his pocket mixed with halfpence. He serves the houses he goes by for a clock. He takes a glass at every ale-house; for thirst when it is dry, and for warmth when it is wet. He likes to show the judicious reach of his whip, by twiggling a dog or a goose on the road, or children that get in the way. His tenderness to descending old ladies is particular. He touches his hat to Mr. Smith. He gives 'the young woman' a ride; and lends her his box coat in the rain. His liberality in imparting knowledge to any one who has the good fortune to ride on the box with him is a happy mixture of deference, conscious possession, and familiarity. . . . He knows the boys on the road admire him, and gives the horses an indifferent lash with his whip as they go by. If you wish to know what rain and dust can do, you should look at his old hat. There is an indescribably placid and paternal look in the position of his corduroy knees and old top-boots in the foot-board, with their pointed toes, and never cleaned soles. His beau-ideal of appearance is a frock-coat with mother-o'-pearl buttons, and striped yellow waistcoat, and a flower in his mouth." In Dickens the dress of a coachman forms a frequent subject of remark, and, as usual with that writer, with some

tendency to exaggeration. One inimitable picture is that where Tony Weller engages his coachman friends to assist in settling his worldly affairs. "It was a kind of festive occasion, and the parties were attired accordingly. Mr. Weller's tops were newly cleaned and his dress was arranged with peculiar care; the mottled-faced gentleman wore at his button-hole a full-sized dahlia with several leaves; and the coats of his two friends were adorned with nose-gays of laurel and other evergreens. All these were habited in strict holiday costume; that is to say, they were wrapped up to the chins, and wore as many clothes as possible, which is and has been a stage coachman's idea of full dress, ever since stage coaches were invented."

The coachman upon his box took the place of the postillion of an earlier date, and derived much of his importance and interest from the personal intercourse this position gave him. Before leaving him, we may present M. Ramée's sketch of the French postillion, who lived, as a driver of public vehicles, long after the English coachman was settled on his box, but who has now also disappeared; and whose successor, as here depicted, contrasts so strongly with our mail-coach driver:—

"To the postillions, national and truly classic; to the postillions with queue plaited and powdered in the old style; to the postillions with light blue jacket, having

facings and collar turned up with scarlet and ornamented with some dozen little tin buttons with the arms of France; to the postillions with yellow or green leather breeches, and round shiny hats with large flaps turned down over the ears; with the splendid jack-boots, and the little whip trimmed bows,—to him succeeded insensibly in the conduct of the great diligences these prosaic and untidy drivers with blue and dirty blouse, cotton hat, and thick wooden shoes generally stuffed with straw. In spite of all this decay and this unceremonious negligence, there was, however, progress; for these coachmen were seated on the seat of their carriage, and with long reins they drove with more confidence than before four or five vigorous and frisky horses *du pays chartrain*, and from this epoch the accidents of public carriages or diligences were much less frequent on the high roads. The French postillion finished by driving only the mail, the carriage of some great lords, of lucky financiers, and often of lovers. To-day he has nothing even of all that; the love or the money has all lessened. Under the reign of Louis Philippe the postillion of the old style became eclipsed more and more, and we can see no more the perfect model but at the ball of the opera, or above all, at the comic opera, in the *Postillon de Lonjumeau*." Perhaps some of the older amongst our readers may remember how popular this *Postillon* once was in England, and

how we all knew, as one of the current airs of the day—

Quite a beau ! quite a beau !
Was the Postillion of Lonjumeau.

THE MAIL GUARD.

The guard, with his horn, his pistols, his solitary seat of honour at the rear of the mail coach, and his authority and importance as director in chief of all the movements of the vehicle, is even more a lost memory than the mail-coach driver. Jehus there are, driving four-in-hand stage coaches, sometimes three-in-hand, after the manner of the modern city omnibus, in districts where the railway, omnipresent though it may seem to be, has failed to supply all the travelling accommodation the public demands. Their sphere is, however, more local than before, for the longer stretches of country are not now open to them, so that, as Leigh Hunt observes, they have to be the politer as their circle of acquaintance is less. The characteristic dress of the coachman is gone, but the weather-browned face, the strong arm, and the communicativeness of the race are here and there preserved, and at ticklish parts of the road—say for example when the loaded Gairloch omnibus of the tourist season rounds the unprotected corner where the ravine of the Kerry amazes or alarms the timid,—the passenger may admire the skilful “tooling” of the *nonchalant* driver or, if of an inquiring and recipient mind, may be regaled, as the

writer has been, with stories of hair-breadth ’scapes at that very corner, when the nights were dark and the horses skittish.

But of the mail guard nothing remains beyond a memory and a tradition. The mail guard was in the pay of the Post Office, and represented in his scarlet coat and gilt hat-band—the royal livery—the authority of the State. Though, as a matter of fact, the driver was frequently also in scarlet, he did not wear the uniform as a badge of authority, as the guard did. It was the guard who saw to the mails, who carried the valuable chronometer provided by the Post Office for regulating the progress of the mail coach, and who interrupted the hurried meal at the wayside inn with the unwelcome intimation that time was up.

There are still, we believe, mail guards in the flesh, and within two or three years back, there was one—we presume the last of his race—who travelled from the *Ultima Thule* of railways, over the Ord of Caithness and on to John o’ Groat’s, or rather to Wick and Thurso. In the writer’s first acquaintance with this “last man” of a passing race, he was travelling on the Carlisle road to Edinburgh. Then the railway came, and his occupation there was gone. Still, at Perth, there was room for one of the old *régime* to take his stand, without the indignity (reserved for the men who still bear the official title of “mail guard”), of sitting in a railway mail van, or the Post Office compartment in a train. Then

still farther drove the iron horse, and the guard found for a time a starting-place at Inverness, till finally he went we know not where.

"Had the pencil of a Hogarth," observes Mr. Lewis, "transmitted to posterity the *tout ensemble* of a London procession of mail coaches in their palmiest days, or even of one of them at an inn-door, the subject could not but have occasioned marked curiosity and pleasure. No doubt he would have given a distinguished place to the guard of the mail, who was no ordinary character, being generally *d'accord* with those who thought or expressed this opinion. Commissions of great importance were oftentimes entrusted to him, and the country banker, for instance, would trust him with untold wealth. Though he was paid only a nominal sum by the Post Office authorities for his official services, he was yet enabled to make his position and place a lucrative one, by the help of the regular perquisites and other accidental windfalls which we need not further specify. Gathering *en route* scraps of local gossip and district intelligence, he was often 'private' and sometimes 'special' correspondent to scores of different people." "The *Muddleton Gazette*, perhaps the only newspaper on his line of road, was submissively dependent on him."

Although it would be possible almost indefinitely to extend the story of the old mail coach, its passengers, its driver, and its guard, we

may fitly close with the following sketch, written half a century ago, of some of the qualities which distinguished the mail guard :—

"We know not, at this moment, any other class of lieges so thoroughly amiable as mail-coach guards. What bold, yet civil eyes! How expressive the puffed-up cheek when blowing a long line of carters into deflection! How elegant the attitude when, strap-supported, he leans from behind over the polished roof, and joins in your conversation in front with a brace of Bagmen! With what activity he descends to fix the drag! and how like a winged mercury he re-ascends when the tits are at full gallop along the flat! See with what an air he flings kisses to every maiden that comes smiling to the cottage door, at the due transit of the locomotive horologe! You would think he had wooed and won them all beneath the dewy milk-white thorn, yet these fleeting moments of bliss are all he has ever enjoyed, all he can ever enjoy, for by the late regulations, you know mails go at the rate of nine knots an hour, stop-pages included, so all such little love affairs are innocent as in the days of gold and before the invention of paper money. The most bashful maiden, knowing that she is perfectly safe, flings towards the dickey her lavish return kisses, and is seen squandering them as if she had forgot that some should be kept for real use and sudden demand."



CHAPTER V.

Now if you want a car, sirs, just come along with me,
I'll drive you out in style, sirs, the country for to see,
My horse will trot along the road, just like a shooting star,
Step up, my boys, be drove along, by Mick of Castlebar.

Irish Song.

IRISH MAILS AND MAIL COACHES—EARLY YEARS OF CHARLES BIANCONI
—ORIGIN OF THE CAR SYSTEM—EXTENT AND GROWTH OF THE CARS
—EFFECT OF RAILWAYS ON THE CARS—THE CAR DRIVERS.

IRISH MAILS AND MAIL COACHES.

THERE is not a great deal in the history of stage coaches, in the ordinary acceptance of that term, to be specially gleaned from Ireland. The first mail coach was seen in that country in 1790, when mails from Dublin to Cork and Belfast were established, and others followed. Perhaps the chief subject of remark regarding them, as distinguished from those of England and Scotland, was that the introduction of Palmer's coaches into Ireland did not put a stop to the highway robberies of the mails that were so frequent under the old arrangements. It is stated that though on some occasions the coach was accompanied by as many as four armed guards, the mails were robbed as frequently as had been "the less aspiring riding post;" and we have seen in a previous chapter, that in the early

years of this century a metal lining was advertised as having been introduced into some coaches as a protection to the passengers.

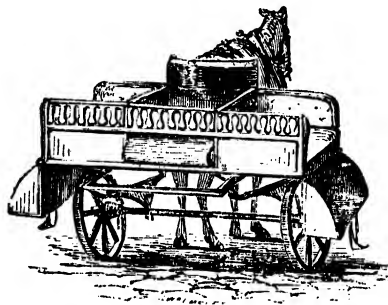
From an interesting paper on the history of the Post Office in Ireland, prepared by Anthony Trollope for the Duke of Argyll, and published in the third report of the Postmaster-General in 1857—we glean many particulars regarding the modes of communication in that country:—

"Posts from England to Ireland were first established by Charles I. It was ordered in 1654 that packets should ply weekly between Dublin and Chester, and between Milford and Waterford. These latter, as well as the Dublin packets, did ply at first, but they were soon withdrawn, and were not re-established for 150 years. In 1662 the line of the packets between

Portpatrick and Donaghadee was established, and direct communication between Scotland and the North of Ireland has been maintained without intermission since that date.¹ The service, however, has not always been done in a very complete manner. For some years previous to 1780 the mails were carried in an open boat; and £1: 1s. was paid for each trip.

"The annals of the Irish post office are very poor. It may

indeed be doubted whether it had any. Could we absolutely learn and describe the very mode in which letters were conveyed on any route—could we portray the sorry beast of burden which carried the bag, the ragged boy who had it in charge, the mountain track which he perambulated, and the slow pace at which he proceeded, no doubt a striking picture might be presented; but unless we have recourse to imagination, little in-



terest can be found in the bald postal details of the times of Charles II., William, Anne, George I., and George II.

"Nothing can give a clearer idea of the state of the country in 1784 as compared with its existing condition, than a review of the postal accommodation then afforded to the provinces. All mails were conveyed, or supposed to be conveyed, by the post-masters, to whom was allowed a certain sum for the service. There were no

contracts, and, as far as I can learn, no fixed rules as to time. Three miles and a half an hour seems to have been the pace acknowledged to have been sufficient. The bags were usually conveyed by boys. In the immediate neighbourhood of the Metropolis some sort of cart was used, but with this exception the bags were carried either on ponies or mules, or on foot.

"In 1788 it was represented to the Lord Lieutenant that robberies were committed on the first stages out of Dublin, the mails being conveyed in open carts driven by

¹ The mail line is now (1877) between Stranraer and Larne.

boys from 12 to 15 years of age ; and that the mails were thus 'an easy prey to the gangs of villains who infest every road leading into Dublin.' Therefore they propose that covered carts shall be built, and 'stout resolute men' employed to drive the carts. The question of the covered carts and the stout resolute men was, however, superseded by the mail-coach system, which was then on the eve of adoption.

"At this time the bags were carried to Cork, Belfast, Limerick, and Waterford six days a week ; and three days a week to Galway, Wexford, Derry, and Enniskillen. There were three posts also to Ennis, which was the only town in the county Clare, except the village of Six-mile-bridge, which had any post at all. There were three in the week to Tralee, and three to Killarney ; but for these last the Government refused to pay anything. The Postmaster had a salary of £3, but the mail was carried by foot messengers, who were maintained at the cost of the inhabitants, and of the news-printers in Cork.

"Carrick-on-Shannon was the only town in County Leitrim receiving a mail, and this it did twice a week. Now it has two every day. The county of Mayo was penetrated twice a week only, a post-rider going as far as Castlebar, and a foot messenger thence at Newport, and another to Killala. There was no office at Westport, and none at the now flourishing town of Ballina. Except at the

county town, there was no Post Office in the whole county of Sligo ; and there were but sixteen in the province of Connaught.

"The great northern line of posts was called the Dublin and Donaghadee road, on which Belfast was situated. Donaghadee, as the port for Scotland, was a place of considerable importance. It has now fallen into a very sere and yellow leaf ; hopes, however, are entertained of its revival.

"There were three post towns in County Derry—Derry, Coleraine, and Magherafelt ; the two latter of which were served twice a week only. In the county of Donegal also there were three offices—Ballyshannon served three times a week, and Raphoe and Letterkenny, twice. No other trace, however, of a post to the town of Donegal can be found than that of the foot messenger, whose wages of £8, paid regularly to a clerk in Dublin, the Secretary had mentioned a few years previously as one of the awkward circumstances to be disposed of. Could the full history of that allowance for a foot post through the mountains of County Donegal be obtained, it would be very interesting. The distance was 30 miles ; the road, a mountain track. How did the clerk in Dublin obtain recognised permission to pocket that one special allowance of £8 per annum, and leave the town of Donegal steeped in Cimmerian darkness ?

"In 1790 the mail-coach system was introduced into Ireland. It was at first confined to the Cork

and Belfast roads, and the two contracts were limited to seven years. In the official report from the Postmaster-General, recommending the measure, it was stated that Messrs. Greer and Anderson, of Newry, would run mail coaches through to Belfast for the sum paid for the mail rides. It appears that Mr. Anderson's name was inserted for some purpose now hardly intelligible, as there was no such person concerned in it. The offer, however, was accepted, and Mr. Greer and his son have been employed in the service on the same road from that date up to the present moment. The same report includes a tender for the Cork line also. The mileage allowance for the road to Belfast was £475 for 60 Irish miles; that for the Cork road £1478, the distance being 126 miles—thus the whole cost was under £2000.

"In recommending the measure, the Postmaster-General pointed out that this sum might be well expended, and with due regard to economy; as any apparent increase of cost would be more than made up by diminution in the solicitors' bills for prosecuting felons in cases of mail robberies! And in support of this surmise it was urged that not a single attempt to rob the mails had occurred in England since the establishment there of the mail coaches. The saving, however, and the expected halcyon period of security did not arrive in Ireland. The mail coaches, though occasionally accompanied by four mail guards,

were robbed as frequently as the less aspiring riding posts.

"The mail-coach system gradually spread itself over the main lines of the Irish roads; and it appears that it did so quite as quickly as the roads were ready to receive the coaches. Up to 1829 the practice prevailed of allowing to the Postmaster a sum for carrying the branch mails through the country; a duty which was done in a very slow and slovenly way. The Postmasters were not themselves horse-owners, and consequently they let out the service to any one who would do it at the cheapest possible rate, without much regard to the manner in which it was performed. The Surveyors, it appears, had no control over the cross mails, and there was no other check than such as might exist at the head office.

"In 1829, and for many years previously, the payment for this work was 5d. the double Irish mile. The average is still much the same, being 2d. the single English mile, which is within a small fraction equal to 5d. the double Irish mile. But though the article is no cheaper, it is much better. The old system of getting the cross mails carried by any animal that the conscience of the local Postmaster thought good enough for such a service does not, however, appear to have been interfered with by the authorities, but to have been gradually amended by the commercial enterprise of a foreigner."

Considering internal communication by stage coaches as a strong proof of national prosperity; Wakefield, in his *Account of Ireland* in 1812 gives a list of about twenty-two different coaches then running in various parts of Ireland, many having the significant addition "with double guard." He shows that all the coaches (except a few mail coaches) started from the capital, that there were miles of country across which no post ever went, that there was no coach, except the mail, in the district from Boyle to Limerick, while east of Cork there was no stage the whole way to Wexford but the Waterford Mail and one mail "dilly." This he adds was not for want of towns, for they were numerous, nor for want of population, for it was abundant, but from want of trade. Bad as this state of matters was, Wakefield adds, "If we compare the present state of internal communication with what it was twenty years ago, we shall find that great improvement has taken place."

If Ireland was not distinguished for her mail coaches, there arose, shortly after the time of which Wakefield wrote, that system of travelling cars which did so much to develop communications in the southern and western parts of that country. These benefits she owed to the "commercial enterprise of a foreigner"—namely, to Charles Bianconi, an Italian who died in 1875, and whose life and labours deserve an honoured place in the history of travelling in Ireland.

EARLY YEARS OF CHARLES BIANCONI.

Charles Bianconi was born at Tregola, a small village near Milan, on 27th September 1788, from which place he was soon removed to the care of his paternal grandmother at Caglio. On attaining his fifteenth year, at which time he had learned little more in the way of education than the art of reading, his father entered into an arrangement with a person named Andrea Faroni to take the lad to England and instruct him in the trade of selling prints, barometers, and looking-glasses. The object of this exile is understood to have been a desire to avoid the conscription, for which Bianconi's son was liable to be drawn. In the event of his not liking that occupation he was to be placed under the care of Colnaghi, of London, who afterwards became famous as a printseller, and who was a friend of the elder Bianconi, being a native of the same part of Italy. Faroni, instead of remaining in London, proceeded at once to Dublin with his apprentice and another Italian lad, also put under his care, and opened a small shop in Temple Bar. This was in 1802. Bianconi could not speak one word of English, and therefore laboured under special difficulties in the prosecution of his vocation. The appeal "Buy! buy!" was easily acquired; but for some time he could only indicate the price of his wares by holding up as many fingers as

there were pence to be paid for the inexpensive articles which he vended. On the termination of his apprenticeship of eighteen months young Bianconi had not only learned so much of his trade, but also so much of the country and how and where business could be done, that he determined to set up for himself. He procured a travelling case and stocked it with coloured prints and other pictures, unmounted and in small frames. With this stock-in-trade he set out, often walking 20 to 30 miles a day, with a package weighing nearly a hundred pounds. His natural courtesy and politeness procured for the Italian lad much consideration, and he found no difficulty in procuring purchasers for his goods. It appears that the labour thus gone through in the prosecution of his business suggested to the mind of Bianconi the desirability of some means of conveyance being provided for the accommodation of the poorer classes. After spending two years as an itinerant dealer, he settled in Carrick-on-Suir in 1806 as printseller, carver, and gilder. His business not being very successful, in the following year he removed to Waterford, where, again, though he worked incessantly, his labours were not rewarded with success. In 1809 he transferred his business to Clonmel, where in addition to his ordinary trade he commenced buying up guineas from the country people. This caused a rumour to be circulated that

Bianconi was buying up gold for the purpose of secretly sending it to Bonaparte, but this only caused the people to enter into the business more cheerfully on account of their sympathies with Napoleón. Of course the transaction was purely a business one on the part of the Italian, who was able to sell the guineas at a handsome profit to the bank.

ORIGIN OF THE CAR SYSTEM.

We have thus rapidly traced Bianconi's career for thirteen years, and left him at last a prosperous tradesman. It was only then that he was able to realise what he had so often cogitated in his mind. "Coming to Dublin eighty years ago as a poor Italian image boy," says an obituary notice of this remarkable man, "he travelled far and near, through roads both rough and smooth, and thus gained an intimate knowledge of every part of Ireland. Often weary and footsore with his own travels, he thought there were many like him who were unable to hire a whole conveyance, but who would join with him in hiring a vehicle periodically, until they had money enough saved to enter upon another speculation. Hence arose Bianconi's car system, which did more to open up this country to traffic and pleasure tourists than can now be readily conceived."

From an excellent sketch of Bianconi's life by Mr. Smiles, published in *Good Words* while the subject of the sketch was yet alive,

many interesting particulars are to be gleaned. We are there informed that on being asked, when well advanced in life, how it was he first thought of starting his car establishment, he replied, "It grew out of my back," while the time to think over the details and possibilities of the scheme was found by him in want of knowledge of the language. This was Bianconi's own explanation when examined before the Committee on Postal Reform in 1838—from which sprang the Penny Post—and to whom, in answer to the question by Mr. Wallace, "What induced you to commence the car establishment?" Mr. Bianconi stated, "I did so from what I saw after coming to this country of the necessity of such cars, inasmuch as there was no middle mode of conveyance, nothing to fill up the vacuum that existed between those who were obliged to walk and those who posted or rode. My want of knowledge of the language gave me plenty of time for deliberation, and in proportion as I grew up with the knowledge of the language and the localities, this vacuum pressed very heavily upon my mind, till at last I hit upon the idea of running jaunting cars, and for that purpose I commenced running one between Clonmel and Cahir."

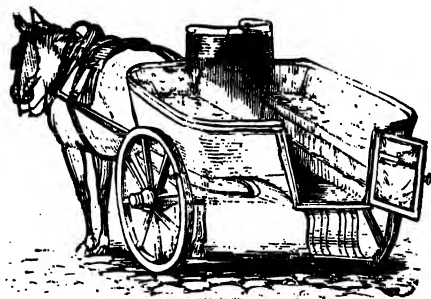
By the year 1815 Mr. Bianconi had amassed considerable property by his trading in Clonmel, and he then resolved to realise his long-remembered scheme of providing cheap accommodation for the masses

of the people. His first venture, as stated in the reply above quoted, was an ordinary jaunting car drawn by one horse and carrying six passengers, which plied between Clonmel and Cahir, and which made its first trip on 5th July 1815. Almost from the commencement the car became a great success, and then the line was extended to Tipperary and Limerick, while another car was placed on the road between Clonmel, Cashel, and Thurles. As a proof of Mr. Bianconi's perseverance, it may be mentioned that the Thurles car ran for two weeks without a passenger; but he was not to be daunted, and few could be found to enter into competition with the energetic foreigner. A year later, in 1816, the car system was extended to Waterford, and this city became one of the centres of operations. In 1818 cars were placed on the road between New Ross, Wexford, and Enniscorthy; then followed conveyances reaching Dungarvan, Waterford, Kilkenny, Cork, Limerick, Tralee, and Cahirciveen.

"People did not know," says Mr. Smiles, "what to make of Bianconi's car when it was first started. There were of course the usual prophets of disaster, who decided that it would never do; many people thought that nobody would pay eighteenpence for going to Cahir by car, when they could walk there for nothing! There were others who thought that Bianconi should have stuck to his shop, as there was no connection

between picture-dealing and car-driving." His determination, in the case of the Thurles car, was rewarded by seeing in the course of a few years four large and well-patronised cars running daily on that line of road. In extending his scheme, Bianconi had to give up his original business, but not until the cars increased so in popularity and success as to engross his whole time. "The cars soon became very popular. Every-

body was under obligations to them. They greatly promoted the improvement of the country ; people could go to market and buy or sell their goods more advantageously. They made it cheaper for them to ride than to walk. They brought the whole people of the country so much nearer to each other. They virtually opened up about seven-tenths of Ireland to civilisation and commerce, and among other advantages they opened markets



for the fresh fish caught by the fishermen of Galway, Clifden, Westport, and other places, enabling them to be sold throughout the country on the day they were caught. They also opened the magnificent scenery of Ireland to tourists, and enabled them to visit Bantry Bay, Killarney, and the wilds of Connemara, in safety, all the year round." Mr. Smiles in those words admirably sums up the benefits which the cars of Charles Bianconi conferred on Ireland in their earlier days.

EXTENT AND GROWTH OF THE CARS.

Our illustrations give a very good idea of the Irish car in its various forms, so far as used for one horse and a limited number of passengers. To accommodate the growth of traffic, however, Bianconi was constrained to introduce larger vehicles and to increase the number of horses. When the number of passengers was increased to eight, two horses were allowed, and eventually the

two-horse car was enlarged to carry ten. Then followed a four-wheeled car, to which three horses were attached, carrying six passengers on each side, and subsequently the car was enlarged, and a fourth horse added, till the total number of passengers carried was increased to eighteen, including the driver.

As regards the connection of Mr. Bianconi with the postal system, by which his conveyances became to a large extent the mail coaches as well as the stage coaches of Ireland, Mr. Trollope, in the paper already quoted, gives the following particulars:—

“In 1815, Mr. Bianconi first carried his Majesty’s mails in Ireland; but he did so for many years without any contract. He commenced in the county Tipperary, between Clonmel and Cahir; and he then made his own bargain with the Postmaster, as he did for many subsequent years. The Postmaster usually retained one moiety of the sum allowed, as his own perquisite, and Mr. Bianconi performed the work for the remainder. What Mr. Bianconi received was thus very small; and he could not and would not therefore run at any hours inconvenient to his passenger traffic, or faster than was convenient to him.

“From 1830, when the English and Irish offices were amalgamated under the Duke of Richmond, the public, as Mr. Bianconi says, got something like fair play; and he and others were allowed

to carry the mails by direct contract with the Post Office.

“From that time till 1848, Mr. Bianconi continued to increase his establishment; and in the latter year he had 1400 horses, and daily covered 3800 miles. The opening of railways has, however, so greatly interfered with this traffic, as to expel his cars from all the main lines. But Mr. Bianconi has met the changes of the times in a resolute spirit. He has always been ready at a moment’s notice to move his horses, cars, and men to any district, however remote, where any chance of business might show itself; and now, in the winter of 1856-1857, when nearly the whole of that district in which he was working ten years since has been occupied by railways, he still covers 2250 miles, and is the owner of about 1000 horses working in the four provinces, from the town of Wexford in the south-east, to the mountains of Donegal in the north-west.

“Mr. Bianconi has done the State good service. By birth he is, as is well known, an Italian, but he is now naturalised, and England as well as Ireland should be ready to acknowledge his merits. It may perhaps be said that no living man has worked more than he has for the benefit of the sister kingdom.”

The cars were so arranged that intercommunication between distant places was maintained with regularity and at a low price—about a penny farthing per mile. Altogether it is stated that the

because done in a district which had long been represented as the focus of unreclaimed violence and barbarism, where neither life nor property could be deemed secure.

"At the Dublin Exhibition of 1853, one of Mr. Bianconi's compact and inexpensive four-wheel outside cars was shown, than which, says Mr. Hooper, "few contrivances are more suitable for conveying a large number of passengers on a minimum weight of carriage." Though somewhat unsuitable as regards shelter in bad weather, they possessed many advantages over the conveyances in London and elsewhere as omnibuses. The weight was kept low, thereby affording safety in case of collision or breakage in any part, and the seats being low were easily accessible for passengers to mount and alight quickly; if the passengers got wet, they at least had what is of infinite importance to human beings—fresh air. These conveyances have been copied and used with much success on the temporary railway annually laid down at the National Rifle Association camp at Wimbledon."

THE CAR-DRIVERS.

The humour, the blarney, un-failing and irrepressible, of the Irish car-driver, have formed the theme of many anecdotes, but considerations of space forbid that we should be tempted into this attractive field. The adventures experienced upon these cars, and the reminiscences of those who

have travelled upon them, would themselves make a bulky volume; while the misadventures and miseries under which the complaining class of travellers have suffered are equally numerous. We must be content with one anecdote, published in the *Gentleman's Magazine* in 1876, and in which a distinguished literary lady—to wit, Mrs. Jameson—plays a conspicuous part:—

"Making my way from a pleasant house in the Golden View to that of another acquaintance on the south bank of the Suir, I had to cross part of the range, flattered with the name of mountains, that divides Cork from Tipperary. Part of the ascent was tediously steep, especially as the road not long before had had a new grey coat of broken stone. The only vehicle they could afford me was a rough jaunting car, on which I was nearly jolted to death. I bore it in silence as long as I could. At length my patience gave way, and I pathetically reproached the driver with having brought me into so sad a plight. In a voice full of concern, but with a lurking gleam of merriment in his eye, he said, 'What's the matter with you, ma'am?' 'Matter!' I cried, half-sobbing with pain and vexation, for it was getting dark, and I knew I had some miles to travel, 'why, you horrible man, I shall never recover from the effects of this thing you call a car!' 'Don't be angry, ma'am; but what is it ails the car?' With this my rage came

to the boiling point as I cried, 'Don't you know that it is not fit for a lady to travel on? I cannot even touch the foot-board with my toe.' With a crack of the whip *obligato* to a persuasive appeal to the horse, which was, I believe, to gain time, lest he should laugh outright in my

face, he replied, 'Ah, then, my lady, does it not occur to you that the fault may be in the legs and not in the car?'

"And no one," adds the narrator, "who had ever seen the narrator enter a room could fail to recognise the fairness of the expostulation."





CHAPTER VI.

Whoe'er has travell'd life's dull round,
Where'er his stages may have been,
May sigh to think he still has found
The warmest welcome at an inn.

SIENSTONE.—*Written at an Inn at Henley.*

INNS AND HOTELS—THE TABARD AT SOUTHWARK—VARIOUS CHARACTERS OF OLD INNS—EFFECTS OF IMPROVED COACHING—IRISH HOTELS—GREATER COST OF MODERN HOTELS—THE GRUMBLING TRAVELLER—THE LAW AS REGARDS INNS—THE REVIVAL OF COACHING—HISTORY OF THE REVIVAL—THE FOUR-IN-HAND CLUB—THE COACHING CLUB—THE SCARBOROUGH AND BRIDLINGTON COACH—THE STRATHPEFFER COACH.

INNS AND HOTELS.

A BOOK on coach travelling, without a chapter, however brief, upon inns, would be incomplete, and a few pages must be devoted to that interesting subject. Since there have been travellers there have been inns, and the translators of our Authorised Version, finding no other suitable word in the English language, used that word to signify the caravanserai in which the Saviour was laid in Bethlehem. In treating of inns, there is quite an *embarras de richesses*, for it is a subject of almost inexhaustible fertility, and the literature of our country, both old and new, is filled with it, from the time of the *Tabard* and Chaucer's Pilgrims down to the days of *Bradshaw* and Cook's Tourists.

THE TABARD AT SOUTHWARK.

The *Tabard* is, or was till recently, in existence, on the very spot, if not indeed preserving the identical building from which Chaucer and his nine-and-twenty companions set forth on their famous pilgrimage. This was the oldest inn in Britain, surviving in its decay many other houses which have become famous and have ceased to exist since it was built. Stow, in writing two centuries after Chaucer's time, says, that "in Southwark be many fair inns for the receipt of travellers, amongst the which the most ancient is the *Tabard*, so called because of the sign, which, as we now term it, is of a jacket or sleeveless coat, whole before, open

at both sides, with a square collar winged at the shoulders." Those who desire to trace the story of this most interesting of all English inns, may do so in Mr. Saunders' admirable paper on the subject in the first volume of Charles Knight's *London*, or in the *Curiosities of London* by John Timbs, where also notices of the Angel (Islington), the Saracen's Head (Snow Hill), La Belle Sauvage

(Ludgate Hill), the White Horse (Fetter Lane), the Bull and Mouth (near the Post Office), the Four Swans (Bishopsgate Street), and numerous others, will be found. Most if not all of those establishments were formed on the same plan, namely: that of a square courtyard, with a covered passage from the street, and hanging galleries round the court, which gave access to the various rooms.



From these galleries any person could watch the animated scene in the court below, where arrivals and departures were constantly taking place. Those examples of the ancient inn have also found an admiring chronicler in Thomas Miller, whose *Picturesque Sketches of London* give notes and illustrations on many of the ancient inns of London. The writings of Dickens may also be included amongst those works where this

attractive feature in the social history of the nation may be studied.

VARIOUS CHARACTERS OF OLD INNS.

There are preserved many various and conflicting characters of the old inns, from the circumstance that amongst so many there must needs have been good and bad, and also no doubt from the

different temperaments of the travellers who patronised them. But undoubtedly the balance of testimony is in their favour.

In Harrison's Description of Britain, prefixed to *Hollinshed's Chronicle*, a high character is given to the inns of England :— "Our inns are verie well furnished with naperie, bedding, and tapisserie, especially with naperie, for beside the linnen used at the tables, which is commonlie washed dailie, ech commor is sure to lie in clean sheets. If the traveller have a horsse, his bed dooth cost him nothing, but if he go on foot, he is sure to paie a penie for the same."

Written at the close of the sixteenth century, Morison's *Itinerary* gives an interesting account of the kind of inns existing and mode of travelling in Scotland at that period. "A horse," he says, "may be hired for twopence the first day, and eightpence the Jay till he be brought home; and the horse-letters used to send a footman to bring back the horse. They have no such inns as are in England, but in all places some houses are known where passengers may have meat and lodging, but they have no arms or signs hung out; and for the horses they are commonly set up in stables in some lane, not in the same house where the passenger lies; and if any one is acquainted with a townsman will go freely to his house, for most of them will entertain a stranger for his money. A horseman shall pay, of oats and straw, for hay is scarce in these

parts, some eightpence day and night, and he shall pay no less in summer for grasse, whereof they have no great store. Himself at a common table shall pay sixpence for his supper and dinner, and shall have his bed free; and if he will eat alone in his chamber he will have meat at a reasonable rate."

In a drinking chaunt of the same period we can read the popularity of the inn :—

He that will an Ale-house keep,

Must have three things in store :

A hogshhead of ale his guests to regale,

And a bush to hang at his door ;

A hostess to fill the tankard at will,

And what can a man wish more ?

Merry hearts,

Aye, what can a man wish more ?

Shakespeare has also numerous references to the inns of London and elsewhere, and to the anxiety with which the wayfarer looked forward to the comforts of those convenient resting-places; as in *Macbeth* :—

Now spurs the 'lated traveller apace
To gain the timely inn.

How enthusiastically Dr. Johnson enjoyed the pleasures of inn-life is proved by the lines of Shenstone, quoted at the head of the chapter, which were especial favourites of the great monarch of literature. The superiority of the older English inns to those of other countries has often been a subject of remark, but of this we must be content with one illustration drawn from the earlier years of last century :—

"I am writing to you at an inn on the road to London," says

Horace Walpole in 1743. "What a paradise I should have thought this when I was in the Italian inns! in a wide barn with four ample windows which had nothing more like windows than shutters and



iron bars! no tester to the bed, and the saddles and portmanteaus heaped on me to keep off the cold. What a paradise did I think the inn at Dover when I came back! and what a magnifi-

cence were twopenny prints, salt cellars, and boxes to hold the knives; but the *summum bonum* was small beer and the newspaper:—

“I blessed my stars and called it luxury.”

This distinction, as regards either comfort or attention, can hardly be said to have been preserved. The hotel-keeper on the Continent is now generally a linguist, a man who has made the keeping of an hotel his profession, and educated himself for it; while in our country the waiters are generally recruited from an inferior and ill-educated class of the community, and the keeping of hotels is principally in the hands of men who have been thus bred. No doubt, in comparison with *some* foreign hotels, the Horace Walpole of our day, on being shown even into the “worst inn’s worst room” in this country, would still “bless his stars and call it luxury.” But taking the hotels rank for rank, and comparing the ease with which a unilingual Englishman can travel on the Continent, with the difficulties of a foreigner here who knows no English, the difference is manifestly against us.

It is recorded as one evidence of the high repute our old inns enjoyed, that the venerable Archbishop Leighton expressed a desire to die at such a place. Burnet, in the *History of His own Times*, quotes a saying of the Archbishop, that “if he were to choose a place

to die in, it should be an inn, it looking like a pilgrim’s home, to whom this world was all as an inn, and who was weary of the noise and confusion of it.” This desire was gratified, for he died in the *Bell* inn, in Warwick Lane, in June 1684.

The inns of olden time were conducted on much the same aristocratic principle as De Quincey notices in speaking of the “scandalous inattention to the comfort of outside passengers by coach.” The pedestrian was, as a rule, an unwelcome guest, even though choosing that mode of travel not from poverty but as a matter of choice, as many do now. Pedestrians with as much ability to pay their way as those who dashed up to the inn-door in a post-chaise were not common last century, and they had but scant courtesy extended to them. Of the reception given to a foot-traveller we have an amusing illustration in the case of Pastor Moritz, whose terrible experiences on the outside of the stage have been depicted, and who fared not better in his inn experience. Most of his journey had been on foot, a mode of progression which, though it is as we have seen, the correct mode of “travelling,” was in those days, as now, only fit for the very poor (the “tramps”) or for “muscular Christians” out on a walking tour. At Eton, Moritz with difficulty got admission to the inn, and a bedroom that much resembled a prison for malefactors was offered to him. “Whatever

I got, they seemed to give me with such an air as showed too plainly they considered me a beggar. I must do them the justice to own, however, that *they suffered me to pay like a gentleman.*" At Nettlebed—appropriate and suggestive name—"they showed me into the kitchen, and set me down to sup at the same table as some



soldiers and the servants. I now, for the first time, found myself in one of those kitchens I had so often read of in Fielding's fine novels ; and which certainly gave me, on the whole, a very accurate

idea of English manners." The chimney in this kitchen, where they were roasting and boiling, seemed to be taken off from the rest of the room and enclosed by a wooden partition. All round

the sides were shelves with pewter dishes and plates, and the ceiling was well stored with provisions of various kinds, such as sugar-loaves, black puddings, hams, sausages, fitches of bacon, etc." The next day the pedestrian put on a clean linen shirt, and dressed himself as well as he could, and was consequently shown into the parlour, where he "was addressed by the most respectful term, sir, whereas the evening before I had only been called master." At Nuneham, the next village, he was treated with great rudeness, and his request for a bed was answered by the inn-door being banged full in the pedestrian's face.

In another case he recalls a system of extortion not yet extinct, even though, as a rule, "attendance is charged in the bill."

"As I was going away, the waiter who had served me with so very ill a grace, placed himself on the stairs and said, 'Pray remember the waiter.' I gave him three halfpence; on which he saluted me with a hearty oath. At the door stood the cross maid, who also accosted me with 'Pray remember the chambermaid.' 'Yes, yes,' said I, 'I shall long remember your most ill-mannered behaviour and shameful incivility,' and so I gave her nothing. I hope she was stung and nettled at my reproof; however she strove to stifle her anger by a contemptuous loud horse laugh."

The delight of this foreigner at being able to realise the pictures of an English kitchen in "Field-

ing's fine novels" may recall to mind the value of the social pictures delineated by this great novelist.

EFFECTS OF IMPROVED COACHING.

There may be some truth in the remark made by a recent writer that "the old inn is now but a relic of a past civilisation—the first shriek of a locomotive's whistle consigned it to oblivion;" but in reality the old inn underwent a very marked change with the advent of the mail coach, when the time for stoppages was very much reduced. It is of such changed times that Leigh Hunt has left us the following picture:—

"The pleasure to be had in a mail coach is not so much at one's command as that in a post-chaise. There is generally too little room in it, and too much hurry out of it. The company must not lounge after their breakfast, even if they are all agreed. It is an understood thing that they are bound to be uncomfortably punctual. They must get in at seven o'clock, though they are all going upon business they do not like or care about, or will have to wait till nine before they can do anything. Some persons know how to manage this haste, and breakfast and dine in the crack of a whip. They stick with their fork, they joint, they sliver, they bolt. Legs and wings vanish before them like a dragon's before a knight-errant. But if one is not a clergyman, or a regular jolly fellow, one has no

chance this way. To be diffident or polite, is fatal. It is a merit eagerly acknowledged and as quickly set aside. At last you begin upon a leg, and are called off."

De Quincey, too, in those autobiographic reminiscences which covered nearly the whole space between Palmer's day and the completion of the railway system, has a word of regret for the comforts of an inn of the old sort :—

"What cosy old parlours in those days ! low-roofed, glowing with ample fires and fenced from the blast of the doors by screens, whose foldings were, or seemed to be, infinite ! What motherly landladies ! won, how readily, to kindness the most lavish, by the mere attractions of simplicity and youthful innocence, and finding so much interest in the bare circumstance of being a traveller at a childish age ! Then what blooming young handmaidens ; how different from the knowing and worldly demireps of modern high-roads ! And sometimes grey-headed faithful waiters, how sincere and how attentive by comparison with their flippant successors, the eternal 'Coming, sir, coming,' of our improved generation."

The same writer dwells upon the hauteur and indifference with which outside travellers were treated at the inns—a continuance towards them of the same aristocratic principle which caused foot passengers to be despised. His story of how the road-side

hotels were gradually compelled to grant to outside passengers the use of basins and towels to refresh themselves in their journey is all suggestive of the same principle :—

"It was upon travellers by coaches that the full oppression of the old vicious system operated. Post-chaise travellers could of course have what they liked, and generally they asked for a bedroom. It is of coach travellers I speak. And the particular innovation in question commenced, as was natural, with the mail coach, which, from the much higher scale of its fares, commanded a much more select class of company. I was a party to the very earliest attempts at breaking ground in this alarming revolution. Well do I remember the astonishment of some waiters, the indignation of others, the sympathetic uproars which spread to the bar, to the kitchen, and even to the stables, at the first opening of our extravagant demands. Sometimes even the landlady thought the case worthy of her interference, and came forward to remonstrate with us upon our unheard-of conduct. But gradually we made way. Like Scaliger, at first we got but one basin amongst us, and that one was brought into the breakfast-room ; but scarcely had two years revolved, before we began to see four, and all appurtenances arranged duly in correspondence to the number of inside passengers by the mail. . . . Con- currently with these reforms in

the system of personal cleanliness, others were silently making way through all departments of the household economy. Dust, from the reign of George II., became scarcer; gradually it came to bear an antiquarian value; basins lost their grim appearance, and looked as clean as in gentlemen's houses. And at length the whole system was so thoroughly ventilated and purified, that all good inns, nay, generally speaking, even second-rate inns, at this day, reflect the best features, as to cleanliness and neatness, of well-managed private establishments."

IRISH HOTELS.

It is curious to find evidence that in Ireland the result of more rapid communication was to decrease the comfort and convenience of the hotels yet so we must interpret the following expression of a writer in *Blackwood's Magazine* fifty years ago:—

"The travelling between Cork and Dublin, saving the indifference of the roads and the discomfort of the conveyances—circumstances causing no complaint, because expectation looked to nothing better—afforded gratifications for which we shall vainly look at the present time. Inns were not only more numerous, but with a few exceptions better provided for the reception and accommodation of the lingering guest. Modern rapidity of travelling, which requires little more than post carriages ready at a moment's call, and

rarely stops but for a hasty refreshment, has greatly diminished the good cheer of the old landlord and obliged his successor to seek compensation in extravagant prices. Excellent breakfasts might then be had for 6d. or 8d. good dinners for one shilling, superlative for 2s. 6d., and right good Bordeaux for two British shillings per bottle; inferior wines in proportion."

GREATER COST OF MODERN HOTELS.

In these last remarks the history of inns out of Ireland may be included, for undoubtedly the prices of the innkeeper have waxed higher and higher, with the increased haste of travelling, and this not only in consequence of the generally increased value of money, but from the fact that travellers make their hotel less of a home and more of a temporary convenience than in olden times. This is more especially true of inns at tourist show-places, which have only a limited season to depend upon, and of the larger hotels in busy centres of life, where there is a constant change of guests at every hour of the day and at every train. A distinguished novelist of our own day—Lord Lytton—has not hesitated so far to destroy the illusions which nearly all former writers have flung around inns, by his querulous declaration that "a night at an inn is, to most rich Englishmen, a tedious torture most rigorously to be shunned."

One would have believed that in modern times, it was the *rich* Englishman who could most readily command "mine ease in mine inn," and there surround himself with much of the comforts of his own house. It is certainly true that in London, and indeed in many other places, only the rich can command the comforts of an hotel, and the matter is not mended by a poorer man seeking a less pretentious house, for, as has been well remarked, second-rate houses have nothing in common with the best inns and hotels *except the expense*. Travellers probably realise now, more even than Pastor Moritz did, that though a lowly appearance may prompt to rudeness or inattention, permission is always freely accorded to "pay like a gentleman."

THE GRUMBLING TRAVELLER.

It must, we think, be admitted in opposition to the phrase of the noble lord quoted above, that in the appointments and general character of the better hotels of modern days there is no ground for any such querulous spirit as the words indicate. As in travelling, so in hotel-living, there are differences of disposition that materially affect the view taken of the same facts—to one man all will be delight and pleasure, the sights of the road glorious, and the refreshment at the inn delicious; while to another there will appear nothing but the evil of the dusty way, and the *désagremens* of a

spot upon the table-cloth at dinner. A popular newspaper-writer, namely "Nether-Lochaber" of a well-known Scottish newspaper, has recently hit off the *genus* grumbler amongst travellers in the following happy way:—

"Tourists in considerable numbers are already on the move; and coaches and steamers alike—never, by the way, in more perfect order than this year—are beginning to carry daily increasing crowds of passengers, so delighted with the attention paid them everywhere, and the elegance and comfort of their surroundings whether afloat or ashore, that a crack with them, as you chance to foregather of an evening, is always pleasant, for the essentials of a pleasant conversation are there to begin with; they are pleased, and you are glad that it is so; the rest is all smooth sailing. You meet an occasional grumbler, of course; a wretch miserable himself, and anxious to make every one else miserable also. An extraordinary customer, in truth, is your thorough grumbler. The Faculty would probably explain it all away by a reference to dyspepsia or some serious derangement of liver. From frequent and close study, however, of a not uninteresting phenomenon, we are rather inclined to think otherwise. In the genuine grumbler the disposition to look at things obliquely and from a false or foreshortened point of view, seems ingrained in and interwoven with his very nature.

In everything he says and does you detect a perverseness of disposition, and a *thrawnness* of temper that you cannot believe to be temporary or accidental, but a veritable part and portion of the man's being from the first. The old dictum about the poet, which after all is only true in a sense, is true of the grumbler absolutely. *Grumblerus nascitur, non fit*; he was born a grumbler, and if you put his mother in the witness-box, and she chose to entertain you with reminiscences of his infancy, her testimony, we venture to say, would go to show that he kicked and screamed at existence and all the surroundings of his nursery at the earliest moment possible for such an exhibition, and that this disposition to hit out right and left indiscriminately at every one and everything, grew with his growth and strengthened with his strength, till in fulness of time he became the thoroughbred grumbler who sat opposite you at the *table d'hôte* a week ago, or rode with you atop of the coach yesterday. With spur on heel, and once fairly in the stirrups, your grumbler is ready to tilt, in dearth of anything more substantial, at his own shadow. Any attempt to mollify him, however well meant and carefully worded, only makes him worse. Do what you can, he remains a grumbler still—implacable, unappeasable. As we generally meet with him here, his grievances for the most part are as to the steamer or coach by which he has travelled, and

the food that he has had to eat. Try to put him right according to your view of it, and you are sure to catch it hot and heavy for your interference in a matter which he declares concerns *him* alone, and with which yet he has been pestering everybody that would for a moment listen to him all the way from Oban to Staffa, or from Ballachulish to Tyndrum. Give a man of this kind the softest cushion in the coziest corner of Cleopatra's barge; the box seat in the victor's own chariot in a triumphal procession; a first and full supply of all the delicacies at the table of Apicius of *De re culinaria* fame, and he would still be the same fault-finder and grumbler. One way of shutting up the inveterate grumbler, very effectual in most cases, is to fool him to the top of his bent—to give him line, in the piscatorial sense. If he complains that his seat on the coach is hard, and the rails behind hurt his spine, assure him at once, in a confidential sort of way, that you believe the axle is horribly twisted, and is as likely as not to snap in twain just about half-way down the next incline. If he complains of the dust, give it as your candid opinion that the Road Trustees should be heavily fined for not allaying the nuisance by a properly arranged water-cart service all over the Black Mount. If he complains that the steamer trembles in all her timbers, and the steam as it escapes at the calling places makes a horrible

noise, agree with him at once, hinting that an explosion of the boiler is a by no means unlikely event through the carelessness of the coal-begrimed stoker who is just then cooling himself at an open air-hole, and wiping his brow with a wisp of tow. If at dinner he abuses the soup, ask him how it could possibly be good seeing that the water whereof it is made was taken a week ago by means of a tarry bucket from the third lock of the Crinan Canal. Does he abuse his salmon? Shake your head sadly, and point with your fork towards the round of beef, hinting that at this season cattle sometimes die a natural death, and then their carcasses are to be had for a third of the market price of good beef. Go with him and beyond him in this sort of way for a little, and he will soon see that you are only poking your fun at him, and the chances are that he will cease troubling *you* at all events with his complaints for the rest of the day. After all, however, it is but justice to observe that even your inveterate grumbler is not unfrequently a much more amiable person than he seems; kind, too, after a fashion, and amazingly liberal when a proper occasion offers."

As regards the high charges sometimes complained of, the best recorded answer is that of a well-known hotel-keeper in Glasgow, who, when challenged about his prices, gave this reply:—"What for should I charge less? *my house*

is fu' every nicht!" And bearing in mind the truth that the value of a thing is just as much as it will bring, this reply is unanswerable.

THE LAW AS REGARDS INNS.

It is part of the legal obligation on all innkeepers—and under this designation are included all who offer, whether by sign or otherwise to supply food, drink, and lodging to travellers or other persons—to keep open house to all comers, without distinction, if they are able to pay their way, and are not drunk, disorderly, or ill of infectious disease. This obligation would appear to have been frequently disregarded, as for instance in the case described by Pastor Moritz, but it is one which an innkeeper is bound to regard to the full extent of the accommodation of his house. This was a general and well-understood obligation but very little appears to have been granted by the law in favour of the innkeeper in return for such a burden.

One of the most curious provisions of this kind,—giving the innkeeper a kind of monopoly in return for his obligation under the common law, is found in the reign of James I. of Scotland, by whom private persons travelling were prohibited from lodging with friends, or anywhere except in the public hosteleries.

The chief privilege enjoyed by the keeper of an inn is his right of lien upon the property of his

guest for the amount of his bill, and this applies whether or not the horse, or gig, or whatever goods, or chattels it may be, are the property of the defaulting guest. The innkeeper cannot detain the person of his customer, for this would amount to a right of perpetual imprisonment without legal authority or process. One consequence of this right of detention of goods without detention of the *corpus*, has been that frequent swindles have been perpetrated by needy adventurers, who, after running up a handsome bill at an inn or hotel, have disappeared and left to be seized by the innkeeper a portmanteau or carpet-bag well filled with—stones and rubbish!

The obligation existing under the old Roman law, under which an innkeeper is held responsible for the safety of his guests and their property, is substantially the law throughout Great Britain, though the books show that in regard to some details differences exist. The general rule is that if a guest be robbed of his goods at an inn, the keeper of the house is responsible, unless there be proved some act of carelessness or contributory negligence on the part of the guest. The fact of displaying valuables in the public room, and then leaving them in that room, would probably be held as a contributory act, and relieve the innkeeper. A traveller is not at liberty to select any room he chooses, and if he do not accept what is reasonably offered, the

innkeeper might order him to seek some other lodging without coming under any penalty.

THE REVIVAL OF COACHING.

Partly from a feeling that under the railway system people have lost that great charm of travelling which consisted in the enjoyment of picturesque scenery and leisurely progress over ground historically interesting, and partly as an outlet for that exuberance of animal spirit which is an inborn characteristic of the British race, recent years have seen, chiefly in London, but also in some other quarters, a revival of stage coaches over favourite routes. The coaches used by the "Four-in-hand Club," and the "Coaching Club," are generally built after the best models of the mail and stage coaches of former times, but with a much higher degree of finish, being in fact, and in the first instance, distinctly private carriages. Had they continued to retain this character, they should more properly have been noticed under an earlier chapter, but the interest of the revival has been heightened by the fact that the coaches have been, in several notable instances, thrown open to the enjoyment of the public, and there is evidence of a probable extension of the system. For a year or two back it has been one of the delights of the London season to book oneself for a day's jaunt on one or other of the splendidly appointed four-in-hand coaches which start from

the *Thatched House* or other notable rendezvous where those coaches start from. To show the extent to which this system had reached



some years ago, it may be stated that the four-horse coaches leaving London daily during the summer

R

of 1873, were, those running to Dorking, Tunbridge Wells, Westerham, Reigate, Sunbury, Watford,

Guildford, Rochester, and Aldershot, and to Brighton on alternate days. These coaches have mostly been put on the road by noblemen and gentlemen who have not looked upon the enterprise in a commercial light or as a source of profit. The price of the ticket for the day's excursion is moderate, and the society found in and upon the coaches delightful; and the traveller has, besides, the occasional felicity of being driven by a "real live lord" or baronet, the owner of the carriage and its spanking team.

In *Blackwood's Magazine* for December 1876, we find the following notes on this revival:—"The English stage coach is virtually gone. So strong was its hold on the popular mind—especially on the various classes whose duty and enjoyment lie in the developing of the powers and virtues of horse-flesh—that there are still efforts by a kind of social galvanism to renew its life. In Pall Mall and Regent Street you may still hear the 'horn hailing the morn,' larger than its old proverbial dimensions of 'a yard of tin.' The official costumes are after the old fashion, only in more perfect taste, and bearing ampler testimony to abundant capital at the command of the projector. The vehicle itself is in the old form made perfect, and enlivened by ever-shining varnish, as if to tell the world

And tricks his beams, and with new-fangled eye
Flames in the forehead of the morning sky.

"The casual public too, has done its duty in showing that 'the ancient spirit is not dead,' and old times are living yet. The whip has his learned and sympathising companions, who note with proper approval or admiration the successful tooling at critical points. In the rumble there are fresh-cheeked country girls, village matrons, and sturdy bucolical gaffers. And yet somehow the whole reminds one of one's fogey contemporaries making spasmodic efforts to renew their youth."

HISTORY OF THE REVIVAL.

Twenty-one years ago there was probably not in existence in Britain, an example of the old post chaise or the mail coach of the formerly recognised type. It has been noted that neither in the Great Exhibition in London in 1851, in that at Paris in 1855, in l'Exposition at Paris in 1867, nor at the gathering in Vienna in 1873, was there shown a travelling carriage such as might be used in posting, while not less remarkable was the absence of public carriages for use on the roads. "It is true," says Mr. Hooper in his Notes on the Exhibition of 1855, "that there are very few four-horse coaches, 'the pride of the road,' now running in England, but considering the high degree of perfection such conveyances had attained before the in-

"So sinks the day-star in the ocean bed,
And yet anon repairs its drooping head,

introduction of railroads in England, an example of one of them would have been worth sending to the Paris Exhibition, as not only in France, but in other countries in Europe, are the public conveyances travelling distances fifty or more miles apart still of the most cumbrous and clumsy construction. It may be said that for every two passengers conveyed by an English stage or mail coach, taking weight for weight, a French diligence or German 'Eilwagen' only carried one passenger, and that at little more than half the speed of our English coaches. Many continental roads are now as good as English roads, and foreigners may much increase the speed of travelling where railways are not yet made." Before another Exhibition came round, the revival had begun, and in the International Exhibition at London in 1862, one of the new carriages formed the "trophy" of the British coach-builders, in the nave of the famous "Hardware Cathedral." It formed a conspicuous object there; being altogether a magnificent specimen of the coach-builder's handicraft, or rather of the assemblage of some twenty or thirty handicrafts called into requisition in the making of a coach.

"It may appear very easy," is remarked by the International Exhibition jury of 1862, "to the uninitiated to build such a carriage merely on the lines of former days, but in fact they require such careful and accurate planning of the several parts, individual and

combined, that only those who have given much attention to them, and have to a certain extent been tutored by the gentlemen who drive them, have been successful in turning out carriages of the kind that in most points meet their requirements. The revival of a taste for such carriages is worthy of remark, as the management of a 'team' not only requires great bodily strength and a quick eye, but being an expensive amusement, is mostly confined to the aristocracy and persons of wealth, with whose habits it is principally associated, and indicates something of that vigour of body which generally distinguishes the British gentry."

THE FOUR-IN-HAND CLUB.

The following sketch of the rise of this club, and the second "meet" or promenade of coaches for the season of 1876, is taken from the *Daily News* of 21st June:—

"It was about twenty years ago, in April of 1856, that the Four-in-hand Driving Club (F. H. D. C.) was started, and the foundation of the club was in the main due to the energetic exertions of the late Mr. Morritt, whose sudden death three summers ago removed a very familiar figure from London society. His team of roans, harnessed to the yellow coach, were as well known in Hyde Park as upon the Yorkshire turnpikes. In the early days of the Four-in-hand Club the number of members was limited to thirty, and any 'coachman' who

did not put in an appearance for a whole year was to lose his membership. The original members numbered but thirteen, and their names are as follows :—The Duke of Beaufort (President), the Marquis of Stafford (now Duke of Sutherland), Earl Vane, Lords Edward and Henry Thynne, Sir Watkin Wynn, Colonel Baillie, of the Blues, and Messrs. Cooper, W. G. Craven, J. T. Jones, C. Leslie, W. Morritt, and W. Thornhill ; with Messrs. Leopold, Agar-Ellis, and Lorraine Baldwin as honorary secretaries. Of these, the Duke of Beaufort, the Duke of Sutherland, Lord Vane (now Marquis of Londonderry), Messrs. Cooper, Craven, Agar-Ellis, and Lorraine Baldwin, alone are still members, the others having either died or withdrawn from the Club. But plenty of fresh blood has been imported into the Club, which now numbers fifty-two members, exclusive of the three household cavalry regiments, the drags of which are classed as belonging to the club. The committee, with the Duke of Beaufort as President, consists of the Duke of Sutherland, Lords Londonderry, Sefton, Macclesfield, Londesborough, Wenlock, and Aveland, of whom, by the way, only Lords Londesborough and Aveland were driving yesterday. The rules of the club are not quite so stringent with regard to attendance as they were at first, but in other respects they are much the same ; and though the foundation of the Coaching Club, which now numbers 120 members, in 1870 was looked upon at the

time as likely to affect the older association, the latter, in spite or perhaps because of its exclusiveness, is as popular as ever.

“Great as is the prestige of the Four-in-hand Club, it was never better sustained than in Hyde Park yesterday, and the second meet of the season, though not so numerous as that of the Coaching Club a fortnight ago, was infinitely more brilliant. In striking contrast to the first meet on the Wednesday before the Derby, when the rain came down in a pitiless drizzle, the weather was as bright as could be desired, perhaps rather too much so for some tastes, and the consequence was that the company which assembled to witness the turn-out was more numerous than ever. More numerous as far as carriages and equestrians went, though, owing to the meet being fixed for the morning instead of the afternoon, there were certainly not so many people on foot—a fact for which Inspector Butler and his men could not but have been thankful. The first coaches to arrive on the ground were those of Lords Poltimore and Craven, but the place of honour on the extreme right in the first line was, as a matter of course, reserved for the Duke of Beaufort's coach, upon which, as it had been announced, the Prince of Wales would be a passenger. The Badminton coach, toolled by Lord Arthur Somerset, with his Royal Highness on the box-seat, followed soon afterwards, and had a full load, for the Duke of Beaufort, Lady Westmoreland,

Lady Emily Kingscote, and Lord Fitzroy Somerset were also outside. This coach had no sooner wheeled into position than Inspector Butler cleared a space a little farther to the right, and a victoria, drawn by two greys, came up, seated in which, and looking remarkably well, were the Princess of Wales and her two daughters. The Princess occupied what we may term the saluting point, for as the drags passed her every coachman, instead of raising the whip, which is the substitute for a bow under ordinary circumstances, had to lift his hat, thereby giving a proof not only of his loyalty, but of his coachmanship. Be it noted, however, that Count Münster, the German Ambassador, did not go through the trying ordeal, as he did not happen to notice the Princess's carriage. The coaches did not keep the best of time yesterday, and it was close upon a quarter past noon before the duke, who acts as President, and who had been personally exerting himself to secure a 'level start,' told his son to move off. The Badminton coach, horsed by three bays and a chestnut, was followed by Colonel Dickson's browns and Captain Whitmore's greys, two teams which, as usual, were almost if not quite perfection. Next came the somewhat scratch team of the 1st Life Guards, driven by Captain Talbot, whose coachmanship is better than his cattle, though in their extenuation it must be said that they have been 'put to' rather frequently of late. The

four horses attached to this coach were two chestnuts, a bay, and a roan next to it being Sir Henry M. Thompson's team of browns, which if a little heavy look like business, and are handled by a coachman who evidently has the ladies with him, so heavy a load of female passengers does he always carry. Lord Londesborough, with four magnificent browns, and Lord Abingdon, with three browns and a bay, followed, and so far resembled each other that neither of them had the bearing-reins against which Mr. Flower carries on so fierce a campaign; and they were not the only two without what one side calls 'instruments of torture' and the other 'economists of coachmen's wrist power.' Count Münster's chestnuts, well matched as they are, and capital as is their action, have not the size or the power of horses adapted for a long journey, though for park work they are faultless. Lord Aveland carries a big load, but his broken team, consisting of a bay, a chestnut, a brown, and a roan, are quite equal to their task. Very useful, too, are Lord Craven's chestnut, two greys, and a bay, and they were better liked than another broken team which Lord Tredegar was driving in borrowed plumes, or (to be accurate) harness. After this team, which was made up of a chestnut, a bay, a roan, and a brown, came Major Wombwell with a brown and three bays, followed by Lord Carington, behind whose superb browns, admirable for their quality, strength,

and action, sat the Duke of Connaught. Lord Muncaster, with bays and browns, was succeeded by Lord Poltimore, whose first appearance it is this season, and who had a very neat team of three bays and a brown. Behind him was Mr. Anstruther Thomson, wearing the insignia of office which had been given him at Alexandra Park on Tuesday, when he took his place in the ring to judge the hunters, and the late master of the Pytchley is as good a man on the box as in the saddle—and that is saying a good deal. He had a team of chestnuts and bays crossed, which did not suffer from a comparison even with Sir Henry Tuf-ton's browns, which came in his track, the rear being brought up by Mr. Oswald's roans, which, if the last, were certainly not the worst. We do not wish to give more than their due meed of praise to the different coaches which assembled yesterday in Hyde Park, but it is only the honest truth to say that eighteen better teams have never, so far as our memory serves, been got together. There were one or two bad ones, but which they were the reader must be left to guess if he can, and of the many good ones, though distinctions are said to be invidious, those of Lords Londesborough and Carington, Colonel Dickson and Captain Whitmore were certainly not the least admired by the 'people who know.'

"The departure was for Alexandra Palace, whither thirteen of the eighteen starters were bound.

Messrs. Bertram and Roberts were 'tried' very highly for luncheon, but they, to speak the language of Newmarket, won the trial very easily. They must have found the consumption of cooling drinks something quite out of the common, and it is to be hoped that they have a little liquid left for the Coaching Club, which is to meet at the Powder Magazine this day at noon, and follow in the wheel-tracks of the Four-in-hand Club to Alexandra Palace. But the scene will be very much like that which was enacted by the banks of the Serpentine yesterday, yesterday fortnight, and yesterday month; so, until the chestnuts bloom again, we may let the two clubs, the members of which are brothers rather than rivals, hold their final meets in peace, only wishing that they may all be alive and well when the time comes round to take up the pen once more."

THE COACHING CLUB.

The history of this club dates from 1870, and, as noticed in the account of the "Four-in-hand Club," its membership is larger than that of the latter. In the following sketch of the second "meet" of the larger club, references are made to both, and also to some former gatherings, but the picture it affords of this new phase of modern life is so graphic and interesting, that we present it entire. It refers to the procession of the club on 5th June 1876:—

"Fortunate again, the junior of

the two 'road clubs' which contribute so much to the glories of Hyde Park in the months of May, June, and July, was favoured with weather which contrasted very strongly with that of last Wednesday fortnight. Upon that occasion the Four-in-hand Club, as was mentioned in these columns, held its first meet, and with the rain coming down in a steady drizzle, only sixteen coaches, or less than half of yesterday's muster, wheeled into position at the powder magazine. The Coaching Club, it may be remembered, had met on the previous Saturday, and, with fine weather to aid, had mustered thirty-one, all told. If rumour could be trusted, the meet of yesterday was to eclipse not only this, but all previous meets, for it was said that the two clubs were to join forces and drive to Richmond. The question naturally arose, how, with such a monster meet, the coaches were to be got into starting position, for the open space in front of the magazine is not either so broad or so long as to leave much space when thirty coaches have been drawn up. It is just as well therefore that the report did not come true, and with thirty-four coaches from one club nobody could complain that he was brought to the north-west end of the park for nothing. That these meets are becoming more and more popular every season is a fact patent to any one who has been present at them these last four or five years, and the crowd was never so dense as it was

yesterday afternoon. The long lines of carriages seem to extend farther than ever, the equestrians would have furnished horses for more than one cavalry regiment, while the people on foot seemed to have invaded every part from which so much (or so little) as the 'passengers' on the various coaches could be seen. But there is no need to repeat a twice familiar story, for the imagination and experience of the reader may be left to fill up the picture.

"By the time that Inspector Butler, evolving order out of confusion, had turned the stream of traffic into the side channels which it had to take as the hour for the meet drew near, some of the coaches made their appearance, and with the assistance of Colonel Somerset and Colonel Armytage, who act as honorary secretaries, they were drawn up into five lines, with seven coaches in four and six in the fifth. Taking them pretty much in the order they held, there was first of all the yellow and brown coach of the President, and this was again driven by Lord Arthur Somerset, as his father is still too unwell to hold the reins. The Duke of Beaufort was present, however, and occupied the box-seat, while behind him sat his daughter Lady Waterford, and his sister-in-law Lady Westmoreland. The Duke's coach was horsed by three very serviceable bays and a brown, while the three coaches standing in parallel lines—those of Mr. Forster, Sir Talbot Constable, and Colonel Somerset—were all

horsed by chestnuts. Sir Bache Cunard, who was playing polo in Mr. Gordon Bennett's team at New York only a fortnight ago, was on the box yesterday, and right well his brown wheelers and bay leaders looked. Mr. Gassiot, too, had a nice team, and Major Jary's four greys are evidently good 'doers.' Mr. Murietta's coach with its four browns was easily recognisable, and this turnout was almost as much admired as those of Lord Carington, Mr. Alfred de Rothschild, and Lord Cole. The last-mentioned was driving the same team which he had out at the previous meets of this and of the Four-in-hand Club, but it was the first appearance this season of Mr. Alfred de Rothschild, whose four bays looked as they went—perfection. Lord Carington's well-known team was also quite up to its usual high standard of excellence, and very neat were Mr. Sandeman's four roans. Captain Hargreaves, who is part proprietor of the 'public conveyance' which runs between London and Windsor every day, has but recently joined the Coaching Club, but he made a *debut* yesterday afternoon of which he has no reason to be ashamed so far as cattle went. Another new member who had a good team was Captain Bill (browns and bays), and in Major Starkie's bays there was much to admire, for they look like work and are remarkably well matched. Lord Poulett was one of the last to put in an appearance, and amongst the other

coaches present were those of Sir Henry Tufton (three browns and a chestnut), Captain Trotter (browns), Major Carlyon (three greys and a chestnut), Mr. Chaloner Smith (two bays, a brown, and a roan), Colonel Thursby (chestnuts), Mr. Oakley (a bay and a grey as wheelers, with a chestnut and a skewbald as leaders), Mr. J. Read (three browns and a chestnut), Lord Charles Beresford, Mr. Carter-Wood, Captain Ashton, and Colonel Aikman. All told, they were thirty-four as they filed down the drive to Hyde Park Corner, the Duke of Beaufort's coach leading the way, that of Sir Talbot Constable following second, and that of Lord Carington bringing up the rear. A fourth at least of the teams were driven without bearing-reins, and some of them did not go beyond Kensington Gore; so it is evident that their proprietors do not share the opinion that bearing-reins, even if out of place for long journeys, are good things to use for park-work.

"As the Coaching Club had arranged to dine at Richmond, the route was not the same as it has been for the last two years, when the Alexandra Palace has been the goal, and to the delight of Knightsbridge, the long procession trotted along the drive parallel to Rotten Row, and, passing the Alexandra Gate and the Albert Memorial, turned out of the Park at Queen's Gate. The crowd at the meet seemed to have gained scent of this arrangement, for by the time the first of the coaches

had reached Alexandra Gate the great majority of the spectators had hurried over the Serpentine and taken up their positions afresh. All the coaches passed this spot, but more than half returned to the park immediately afterwards, leaving some thirteen or fourteen to do the whole journey to Richmond. One of the first to turn back was Mr. Alfred de Rothschild, who had to preside last evening at the annual dinner of the Royal Theatrical Fund. He was soon followed by Sir Henry Tufton and others, who, it may be guessed, are anxious to keep their teams fresh for 'the Ascot Week,' the exigencies of which are very considerable. Altogether the meet was a great success."

From a briefer notice of the first meet of the Coaching Club for 1876 we extract the following, as it furnishes the names of one or two additional members of the aristocracy who join in this now fashionable and most attractive occupation:—

"The coaching season has at length fairly set in. Already several coaches have commenced business for the season 'down the road,' and on Saturday the more swell vehicles had their annual turn-out in Hyde Park, afterwards driving to the Alexandra Palace, and showing themselves off to the numerous pleasure-seekers assembled at Muswell Hill. The display was quite up to the usual mark; though the Duke of Beaufort, who usually 'leads' on the occasion, and is generally accom-

panied by the Prince of Wales, was absent through an attack of his old enemy, the gout. In his Grace's absence, Lord Carington assumed the lead, accompanied on the box by several Indian gentlemen who had come over with the Prince, of whose suite his Lordship was a prominent member. As many as thirty coaches attended the meet; and he must have been a fastidious person indeed who could not find some to admire and others to covet amongst the 120 high-steppers that pawed the ground near the powder magazine prior to the start. Brown-blacks, bays, chestnuts, greys, roans, and other equine colours made up a show of horse-flesh such as is possibly not to be met with anywhere out of England, and which would have been an interesting subject of study for the croakers about the degeneracy of our horse supply. Lord Macduff had a team of brown such as might have made a prince envious; while Colonel Somerset and Sir Thomas Peyton held the ribbons of two chestnut teams such as are only seen out on 'Coaching Club' and 'Four-in-hand' days."

THE SCARBOROUGH AND BRIDLINGTON COACH.

Amongst the more prominent of the public coaches recently started in Britain is the "Scarborough and Bridlington Coach" which is also, like those described as starting from London, "worked by gentlemen for gentlemen," to

parody the boast of the *Pall Mall Gazette*. The following description of this coach, in which past and present travelling are contrasted, is taken from the *Yorkshire Post* of 13th September 1876 :—

“There is a sort of poetic justice in our partial return to the old coaching days, after the railway system has been extended to all parts of the country. The old system of conveyance, slow and inconvenient though it was, had still many advantages which the railways do not possess. To begin with, there was the comparative immunity from accidents. Of course careless driving or the impossibility of seeing the way on a dark or foggy night, might sometimes land the coach in a ditch, but the danger to life and limb was small compared with that on the railways, when twenty, thirty, or forty persons are sometimes hurried into eternity almost in an instant, and others sustain injuries which materially shorten their lives. Highwaymen may have stopped the stage coaches too, but your life was always safe if you only delivered up any valuables you had about you ; and if the stories told of these gentry are to be believed, they treated you in such a courteous and gentlemanly way that it was rather a pleasure than otherwise to hand over your portable property to their care. Then, trying as the winter journeys must have been, the traveller by coach would evidently feel a keen delight in bowling along a country

road behind a splendid team which even the Pullman car could not give.

“But of course when speed is considered, the stage coaches are literally nowhere. It is amusing to look at a record of coach-pace in the olden times, fast as it often was, and compare the distances then performed in a day with those which are constantly covered by travellers now. It was thought a wonderful feat when in 1825 the ‘Shrewsbury Mail,’ a coach which maintained its character for safety, punctuality, and speed for thirteen years, ran 154 miles in one day. One can imagine the astonishment and admiration depicted on the faces of grooms and loungers when the coach drew up in the old inn yard after this journey was over—how the horses would be patted and encouraged by those mysterious sounds which stablemen always make, and which horses are popularly supposed to understand ; and how the travellers by the mail would be surrounded and eagerly questioned about the rate of speed maintained. Afterwards this feat was considered nothing. The ‘Quicksilver Mail’ commenced to run from London to Exeter, 175 miles, in eighteen hours, and the ‘Telegraph’ used to leave London at half-past five in the morning, and reach Exeter at half-past ten the same night. In 1836 the fastest coaches, known as the crack coaches, were running between London and Brighton, 51½ miles, in 5¼ hours ; Shrewsbury, 154 miles, in 15 hours ; Exeter,

175 miles, in 17 hours; Manchester, 157 miles, in 16 hours; Holyhead, 261 miles, in 26 hours 55 minutes; London and Liverpool, 203 miles, in 20 hours 50 minutes. On May-day, 1830, the 'Independent Tallyho,' which ran between London and Birmingham, performed a feat altogether unparalleled in the annals of coaching, having travelled the distance of 109 miles in 7 hours and 10 minutes. On May-day, 1838, the 'Shrewsbury Greyhound,' with no passengers except a friend or two of the proprietor's, accomplished the distance from London at the rate of twelve miles an hour, including stoppages. Great as this speed must have appeared to the wondering inhabitants of those days, we can smile at it now. The description of Nicholas Nickleby's long and miserable winter coach-ride from London to Yorkshire will perhaps be remembered by the reader. In these days Nicholas would simply have taken his ticket in London at breakfast time and have been in Yorkshire in comfortable time for an early dinner, while Mr. Squeers would have been deprived of those frequent opportunities of 'stretching his legs,' of which he appears to have made such good use. This comparison between the advantages and disadvantages of the two modes of travelling, which might be carried much further but for the fear that it might become wearisome, is suggested by the number of coaches now on the road during the summer, and

more particularly by the coach which has been running daily all through the season between Scarborough and Bridlington. In the south of England numerous coaches ply between London and the chief towns in Suffolk and Sussex. In front of an old hostelry in fashionable Pall Mall you may see any morning well-appointed coaches drawn by splendid cattle and tooled by a crack 'whip,' making a start for Dorking, Guildford, or Brighton. Few enjoyments can possibly be greater than a seat on the box during the drive through the lovely scenery of Surrey. The only one which strikes us at the present moment is a coach-ride through the still more lovely scenery of Yorkshire. And from the 'outside' of the Scarborough and Bridlington coach some really beautiful views can be obtained—views of quiet, peaceful villages, of the sea at Filey, with perhaps the waves dashing furiously over the Brigg, a distant glimpse of the Yorkshire wolds, and occasionally such cloud and sunset effects as would delight the soul of an artist.

"The coach in question is driven—or 'tooled,' if the expression is preferred—by Mr. George Lowther, brother of the member for York. Throughout two seasons Mr. Lowther has stuck to his post, and his reward has been the great amount of interest shown by the visitors in his undertaking, as well as the knowledge that he has given pleasure to a large number of people who would probably

have no other opportunity of experiencing the delights of a modern ride by coach. There is generally quite a lively competition for places, and a number of those stay-at-home travellers, who have not made up their minds to undertake the journey, go down to the Royal Hotel to see the coach start. And in the matter of starting there is a wide difference between the old stage coaches and the new. Everything now is well regulated. There are no grooms actively engaged in doing nothing particular, but appearing, as is the custom of grooms, as if the fate of empires depended upon their every movement. The passengers ascend to their places quietly; the guard, who is dressed in a brilliant scarlet uniform, and is addressed by the passengers as 'Mr. Page,' calls out cheerily, 'All right, sir,' and in a minute—almost before our scarlet-coated friend has had time to perform a preliminary flourish on his horn—the coach is on its way to Bridlington. Although the coach horn is not generally to be commended as a solo instrument, there is something inspiring in the sound of its notes when you are bowling along behind a splendid team. And as you leave Scarborough and find yourself in the Seamer Valley your spirits rise, and the notes of the guard's horn make for you the only music you would just then care to hear. Leaving Seamer on the right, and passing over the railway at Seamer Junction, the 'outsides' are

brought in view of the pretty little village of Cayton. At Cayton, and indeed at other villages, most of the inhabitants turn out as the coach passes. This appears to be one of the pleasant peculiarities of village life. The inhabitants never seem to be in a hurry, and they are never so much occupied with their own affairs but that they can find time to pay some attention to those of their neighbours. And though the passage of the coach through the villages between Scarborough and Bridlington occurs twice daily, the cottagers evidently take as much interest in the proceeding each time as if it were entirely novel. Villagers in the old stage-coach days of course did precisely the same thing, and even the most unimaginative traveller will have very little difficulty in casting himself back fifty years or so, as the labourer pauses in his field work and looks up at the coach with interest, as the housewives run to their doors, and the village urchins give a cheer as the coach rattles down the road.

"Passing Gristhorpe and Libberston, through some very pretty scenery, Filey is soon reached, and here the team is changed, and after a short stay the 'Gentlemen, please,' of the guard summons you to your places again, and in a minute or two you are continuing your journey towards Bridlington. You again sit behind four splendid animals, a bay and roan wheelers, and a beautiful chestnut and a bay leader. When there

are no lady 'outsiders,' you may produce your cigar-case, and let all your troubles end in smoke. We have more solos on the coach horn—by the way, Herr Wagner is so fond of brass when writing for an orchestra that his attention ought really to be directed to this instrument—and again the villagers come to their doors and the labourers leave off their work and stand staring till the coach has passed quite out of view. The sight of the lightly built and elegantly appointed coach, with its guard in scarlet coat and white beaver hat, must be a pretty one, while lovers of horseflesh cannot fail to watch the team with interest. Passing Hunmanby, Speeton, Bempton, and Marton, we presently arrive in sight of Bridlington, and after going through the streets at a good pace, reach our destination, the Britannia Hotel. After a pause for luncheon, during which time the return team to Filey is being harnessed, the coach starts on its homeward journey, and Scarborough is reached about half-past five.

"Everything in connection with the journey is admirably arranged. You leave Scarborough late enough to prevent any undue hurry over breakfast, and you return in comfortable time for dinner. The coaching season will close very shortly now, and the horses will be brought to the hammer. During the present season more particularly Mr. Lowther's coach has formed by no means the least important of the many attractions

of Scarborough. The amount of interest manifested in this coaching enterprise by the public must be very gratifying to the 'whip,' and it is to be hoped that in future seasons he will continue the pleasant work he has so successfully commenced. Those who have taken the journey will agree with the sentiment that there are few more pleasurable ways of spending an idle day than in indulging in a modern coach-ride through the beautiful scenery which borders on the Yorkshire coast."

THE STRATHPEFFER COACH.

The establishment of regular coaches, of which the general public is invited to enjoy the benefit, is not confined to London. In the beginning of July 1876, Mr. Allan A. Mackenzie, yr. of Kintail, a member of the "Coaching Club" in London, placed on the road between Inverness and Strathpeffer a magnificently appointed coach, taking the reins himself in a style worthy of the fame of the modern "gentlemen coachmen" he represents. The intention was to continue the coach during the summer months, and the enterprise was received with much favour by the people of the district as well as by visitors. Four complete teams with several spare horses were provided for this coach, which left Inverness about 10 A.M. and returned about 7 P.M.; the "spanking" pace of nine miles an hour being maintained throughout. The coach, in addition to

furnishing a most delightful "outing" and a pleasant way of visiting one of Scotland's most famous spas, presents one advantage over the railway with whose business it seeks to some extent to cope, that it passes through several centres of population, which are by the exigencies of engineering left at some distance from the railway route, so that pleasure and convenience are most agreeably blended in the enterprise.

The following summary of stage coaching past and present, from one of the newspapers of the day, may fitly conclude this part of the subject :—

"Stage coachmen are no longer called upon to stand and deliver ; are no longer forced either to fight or fly for their lives. But they have always been a persecuted race ; and it would seem to be their destiny only to escape danger in one shape to meet with it immediately afterwards in another. So arduous and perilous in some parts of Europe is the life of a driver, that popular imagination invests him with many of the attributes of a hero. Such is the Russian *yamstchik*, who traverses long distances, in all weathers, at the risk of being interrupted, not indeed by bicyclists, but by snow-storms which may block up the road, by robbers who may plunder him, and by wolves which may devour him. The driver on the eastern plains of Europe is as popular a personage as the sailor of the northern and western seas. Artists paint him, poets and com-

posers make songs about him, young maidens love him. He, on his side, tries to merit these favours by strict attention to the business of his part, which consists not only in rapid and seemingly reckless driving, but also in assuming a picturesque attire and in singing sentimental songs.

"In England, also, the coachman has long been looked upon as a character of some importance ; and even on the new four-horse vehicles which, as if in memory of the past, have been set going on so many roads, a certain number of extra shillings are charged for the privilege of occupying the box-seat, including, as it does, the right of talking to the driver. It needs only a limited acquaintance with the novel literature of the last century to know that it was once the custom for passengers not only to fee the coachman with a fee not specially charged for in the price of a seat, but also to offer him refreshment, usually in a liquid form, as often as the coach stopped. Owing, no doubt, to constant movement and abundance of fresh air, he could, without bad effects, consume an amount of drink which was practically unlimited. He had plenty of good stories to tell, possessed a certain knowledge of character, and was often not without character himself. He was not, however, the absolute monarch of the road. In the midst of his best anecdotes it was sometimes his fate to be pulled up short by a dashing highwayman, against whom he but

rarely contrived to make a good fight. This was the 'something bitter' in his cup. He was a very great man in his way, and could generally give a good account of himself by word of mouth; but he had his master on the great thoroughfares, and in presence of a DUVAL or a TURPIN was obliged to succumb. As civilisation, however, progressed, the highwayman disappeared, and for a space of time the British stage-coachman must have been supremely happy, yet not for long. An enemy more irresistible and more persistent than the highwayman was soon to appear. The steam-engine was invented, and railroads were everywhere laid down. To the happy period which intervened between the suppression of highwaymen and the general introduction of railways the greatest stage-coachman in English literature belongs; and the effect of railway opposition was, as every one knows, to break old Mr. WELLER's heart. When 'Pickwick' first appeared the road was indeed in a thriving condition. The railway whistle had already been sounded, but the doomed coachmen did not yet recognise it as the signal for their extinction. They 'heard it,' but they 'heeded not;' indeed, many of them laughed it to scorn. They were a

truly conservative race, and quite unable, when they at last found that their battle against steam was unavailing, to shift their ground from road to rail, and seek employment as engine-drivers and stokers. They preferred to perish; and the old race of stage-coachmen apparently died out.

"The spirit of coaching still, however, lurked in the heart of the nation, and the last few years have witnessed a partial revival of the interest once universally felt in the glories and humours of the road. To the Four-in-hand Club a similar association called the Coaching Club was added. A club proper, under the title of the Road Club, has lately been formed; and meanwhile stage-coaches have been started on every great road leading out of London. These coaches are, for the most part, private enterprises, in so far that they are supported by amateur whips, and are not run for the sake of gain. Those, moreover, who travel by them do so for their own pleasure, and believers in the doctrine of *l'art pour l'art* may be pleased to see their favourite idea realised on the high road, where driving, under the new conditions, is certainly practised for the sake of driving."



THE CANAL.

CHAPTER I.

My son, the road the human being travels,
That on which blessing comes and goes, doth follow
The river's course, the valley's peaceful winding
Curves round the cornfield and the hill of vines,
Honouring the holy bounds of property,
And thus, secure, though late, leads to its end.

Piccolomini—SCHILLER.
(Coleridge's Translation.)

HISTORICAL NOTICES OF CANALS—CANALS IN CHINA—INVENTION OF
THE CANAL LOCK—EARLIEST MODERN CANALS IN EUROPE—
CANALS OF BRITAIN—REMAINS OF ROMAN CANALS IN BRITAIN
—EARLY PROPOSALS FOR CANALS—JAMES BRINDLEY—BRINDLEY'S
FIRST CANAL—FURTHER ENTERPRISES—CANAL TUNNELS—
CANALS IN SCOTLAND AND IRELAND.

HISTORICAL NOTICE OF CANALS.

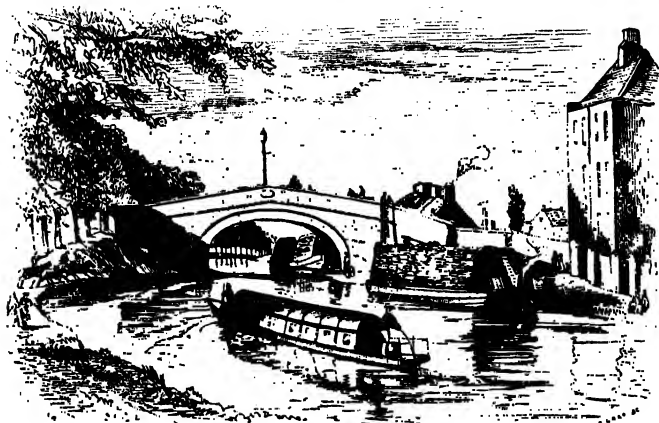
As a means of travelling, in the sense in which this book is written, canals have till recently occupied a very subordinate place, while in many countries, and even within Britain itself, they fulfil important functions in commerce, supplementing and competing with the railway system in the carriage of goods, especially of the bulkier and less valuable sort. As will be seen in the sequel, a new development of the canal system has been made, interesting under the head of travelling (though beyond our geographical limits), and worthy of detailed investigation. We refer to the actual completion of the Suez Canal, and the proposals to

shorten some important sea routes by means of canals. Amongst these are the canal projected to join the Atlantic and Pacific through the Isthmus of Darien; the proposal to unite the Mediterranean with the Atlantic through a new development of the ancient canal system of France; the Amsterdam canal now completed, and the Paumben Channel, proposed to be made north of Ceylon.

Canals are of very great antiquity. Who were the first people to "roll obedient rivers through the land" cannot now be stated, but from the classical writings—Herodotus, Pliny, Aristotle, and others—there is reason to conclude

that canals were employed in Egypt—as will be noticed at further length in a succeeding chapter—and probably in Assyria and India. Both the Greeks and the Romans attempted to cut a canal across the Isthmus of Corinth, while in the history of British canals it will fall to be noticed that the “Masters of the World” have left traces of works that

were undoubtedly canals. The adventures of Horace, as described in his fifth satire of the first book—the famous voyage by water to *Brundisium*—will be familiar to every schoolboy. Part of his adventures on that memorable journey may serve as a modern picture, as neither the overcrowding of public conveyances, nor the use of rough language by barge-



men which he describes were peculiar to classic times :—

Now 'gan the night, with gentle hand,
To fold in shadows all the land,
And stars along the sky to scatter ;
When there arose a hideous clatter,
Slaves slanging bargemen, bargemen
slaves.

“Ho, haul up here ! how now, ye
knaves,

Inside three hundred people stuff ?
Already there are quite enough !”
Collected were the fares at last,
The mule that drew our barge made
fast,

But not till a good hour was gone.

Sleep was not to be thought upon ;
The cursed gnats were so provoking,
The bull frogs set up such a croaking.
A bargeman, too, a drunken lout,
And passenger, sang turn about,
In tones remarkable for strength,
Their absent sweethearts, till at length
The passenger began to doze.
When up the stalwart bargeman rose,
His fastenings from the stone unbound,
And left the mule to graze around.
Then down upon his back he lay,
And snored in a terrific way.”

CANALS IN CHINA.

The Chinese possess canals of

undoubted antiquity and vast extent, the Imperial Canal, which connects Hangchow with the river system of Peking, being about a thousand miles in extent. Part of this canal, namely, that towards the south, is believed to have been made as early as the sixth century, but the northern portion dates from the thirteenth century. "This canal," as we read in Col. Yule's edition of the Travels of Marco Polo, "appears to have been completed in 1289, and is said to extend for a distance of forty days' navigation, and is provided with many sluices, and when vessels arrive at these sluices they are hoisted by means of machinery, whatever their size, and let down into the other side into the water."

A writer of our own day says: "Availing themselves of the great number of rivers and lakes that exist in their country, the industrious Chinese have almost everywhere opened communications by water, and for this purpose, and for the object of irrigation, have dug so many canals that much of China is like a vaster Holland. The traveller finds almost everywhere a large canal of fine, deep, clear water, flanked by two causeways cased with flat stones or marble slabs, set in the ground and fastened by grooves made in posts or columns of the same materials. From the main canal there shoot off, at certain distances, numbers of smaller canals, the waters of which are again let off into in-

numerable rivulets that are conducted to different large towns, or employed to irrigate the country. Besides these, they have an infinite number of reservoirs and channels by which they can lay the fields under water, to produce rice, their principal food, and which requires almost constant humidity.

"But nothing in China or any part of the world is to be compared with the Yun Leang, or Royal Canal, which is 300 leagues in length. It was dug by an almost incredible multitude of men, and at a most prodigious expense, under the emperor Chi-tson, (about the year 1280), the founder of the dynasty of the Western Tartars. 'This canal,' says Du Halde, 'traverses the provinces of Pe-tche-li and Chan-tong; then it enters the province of Kiang-nan, and discharges itself into the great and rapid Yellow River. Down this river you sail for two days, when you come to another river, where you find again the canal, which leads to the city of Hoai-ngan; from thence it passes by many cities and large towns, and arrives at the city of Yang-tcheou, one of the most famous ports of the empire; and a little beyond this place it enters the great river Yang-tse-Kiang, which divides the province of Kiang-si nearly into two equal parts, and runs as far as Nan-ngan, from whence you go by land to Nan-kiong, the chief city of the province of Quang-tong, where you embark upon a river that leads to Canton, so that you may travel very commodiously,

upon the rivers or canals, from the capital to the remotest part of China, being about 600 leagues, by water.'"

Between Yang-fou and Tchu-sau, where two canals meet, the difference in the level of their waters is six feet. To pass the vessels from the one to the other, the most simple plan has been resorted to. A glacis or inclined plane, at an angle of about forty degrees, built with stone and kept smooth or slippery, rises at the end of the canal, and the vessel that has to pass from the lower to the upper water is dragged up, having cables attached to her, by means of two or more (sometimes as many as six) enormous capstans, which are placed by the sides of the canals above the inclined plane. Each windlass has four bars, manned by from twelve to sixteen men. Having once made the ascent, the vessel descends by the force of gravity into the upper canal by means of another but shorter inclined plane, the apex of the two planes being always somewhat above the level of the water in the upper canal. When the vessel has to pass from the upper to the lower canal, the labour is of course less, as she has only to be dragged up the smaller inclined plane, when she glides down the lower one of herself.

One object of the Imperial Canal was to keep the capital supplied with provisions from the more fertile portions of the Empire, and to save the vessels conveying

them a tedious and somewhat dangerous sea-voyage. In this respect the Imperial Canal of China has a character of its own, the general purpose of canals being to open up inland districts otherwise without communication, to shorten journeys by cutting through necks of land, and to facilitate generally the commerce of the country.

INVENTION OF THE CANAL LOCK.

The fact of vessels being hoisted by means of machinery from one level to another will suggest one important difference between the ancient and the modern canal, namely the absence of locks in the former. It has been often a matter of astonishment that so very obvious a means of overcoming the difference of levels on which those water-ways must necessarily be made should have escaped discovery amongst such highly educated communities as those of Egypt, or people of so much ingenuity as the Chinese. The plan adopted by the latter has not been without supporters, for according to the opinion of Dr. Dinwiddie, who had an opportunity of examining more at leisure the common canal and the other canals whose communication is maintained by means of this *glacis* or inclined plane, "the flood-gates of the Chinese are preferable to English locks in every situation where the canal is nearly level, and are constructed at a quarter of the expense. The inclined

plane down which the boats are launched, and up which they are drawn, is a mode superior to our practice, for besides their being cheaper they are much more expeditious. The time employed in one instance observed, was only $2\frac{1}{2}$ minutes, in another about 3 minutes." Many more people will, however, be disposed rather to accept the opinion of a writer in the *Quarterly Review* that "to us, living in an age of steam engines and daguerreotypes, it might appear strange that an invention so simple in itself as a canal-lock and founded on properties of fluids so little recondite, should have escaped the acuteness of Egypt, Greece, and Rome." To whom the invention of the lock is due is a point of dispute, the controversy being conducted with nearly equal success on behalf of the engineers of Holland and those of Italy. Leonardo da Vinci, the eminent painter, is claimed by the Italians as possessing the master-mind which struck out the happy thought that made canal-navigation what it now is. Probably the conclusion arrived at by some writers is the correct one, that the lock was not an immediate invention, but a growth, the steps towards the complete idea being gradual, and being also made independently in different places, as great inventions often are.

It has been alleged that the first application of the *double-gated* lock—to which alone we apply the term in modern days—was the

work of the brothers Denis and Peter Domenico, of Viterbo, about the year 1481. To them Zendrini, an eminent Italian engineer of the seventeenth century, yields the honour of the achievement of "enabling boats and barges to pass through the sluice of Stra without danger, without being unloaded, and without being dragged; contriving at the same time that the waters shall issue with facility"—a very accurate description of what the lock is intended to accomplish. Frisi, another Italian writer, says, however, of these works, that they were "constructed without any difference of level between the upper and inferior beds (*fonda*) as far as we can judge by the hinges of the gates which are still extant," and that the staircase locks (*sostegni a gradino*) of the canals at Venice, at Bologna, and at Milan, all nearly of the same dates, were to be attributed to Leonardo da Vinci. Still another Italian writer could be quoted who throws back the invention to an earlier date, and alleges that some staircase locks were constructed even in the fourteenth century. Be this as it may, it is remarked by the writer of the *Quarterly Review* article that as the building of St. Peters indirectly assisted the Reformation, so the building of the Duomo at Milan led to an advance in hydraulics, which, if not amounting to the double-gated lock, was shortly followed by that invention. "It was to overcome the difficulty of conveying the materials for the Duomo from the

Alpine quarries of Candoglia that some contrivance became necessary for lifting vessels from one level to another. The Ticino and the canal had brought the marble to the suburbs of the city, but there it remained till the ditch in the city, having been rendered navigable, but at a higher level, certain *conche* were devised for passing the vessels by an alternate increase and decrease of the water (*pro faciendo crescere et decrescere aquam*). These are the words used in an account of the expenses of the work existing in the archives of Milan." After quoting other authorities, this writer concludes in favour of Leonardo da Vinci, and says:—

"One fact only seems certain that the first application of a series of locks by which water and what it floats is made to walk up and down stairs, was the work of that master-mind which for variety of accomplishment has no equal perhaps in the records of human genius and acquirement, of one who had the hand of Apelles and the head of Archimedes—who with the first that could with equal felicity give their respective expression to the countenances of our Lord and his betrayer, and trace the intricacies of wheel work and the perspective of machinery,—with the second could all but anticipate, in an age of comparative darkness, the discoveries of Copernicus, Newton, and Cuvier."

The claims of Holland to the honour of discovering the "pound-lock," to give it its expressive

English name, are stated in the article "Inland Navigation" in Sir David Brewster's *Edinburgh Encyclopædia*, written by Messrs. Telford and Nimmo, who claim for Holland a priority of half-a-century over Italy in the application of the lock.

Another distinctive feature of the modern canal is the aqueduct, for though as regards the conveyance of water for itself, "it is not in England that we can find a fit subject of direct comparison with the *Pont du Gard* or the aqueducts of Italy," in the use of the aqueduct for the conveyance of traffic by water, we have done what the ancient people had not conceived, or at least had not carried out.

EARLIEST MODERN CANALS IN EUROPE.

The first modern instance of the use of an aqueduct for canal purposes is believed to be in the canal of Martesana in the Milanese, which, so early as 1460, was carried over the torrent of Molgora upon a bridge of three arches of thirty feet span.

The date when the lock was perfected is a subject of doubt, the achievement being, as we have seen, variously stated as having been attained in the fourteenth, fifteenth, and seventeenth centuries. Without a doubt, it was known at the last-named period, not only in Holland and in Italy, but in France. The first canal in France, that of De Briare, connects the Loire and the Seine, and was

begun by Henri Quatre in 1605, and finished in 1642. This was followed by the more important Canal of Languedoc, or *Canal du Midi*, designed by Riquet, which provides a passage for small vessels from the Bay of Biscay to the Mediterranean, saving a sea-voyage of 2000 miles. The larger canal of which we have spoken, to connect the English Channel with the Mediterranean, would furnish the same accommodation for vessels of a larger size.

The *Canal du Midi*, which is sixty feet broad and about one hundred and fifty miles in length, reaches a summit-level of six hundred feet above the sea. It is furnished with above a hundred locks, and fifty aqueducts of various dimensions, and it is stated that the work employed the labour of twelve thousand men for fifteen years—1667 to 1681—and cost over £1,200,000 sterling. Altogether France possesses at the present day nearly three thousand miles of canal-navigation, and as the canals, about a hundred in number, are mainly used in connecting together navigable rivers, the inland navigation of that country is estimated at a total of 8400 miles. The sluggish rivers of the Low Countries have been linked together by a vast series of artificial cuttings, so that the countries of Holland and Belgium seem one vast network of water communication, in which it is sometimes difficult for a stranger to decide whether he is looking at a river that has been walled in to

prevent overflow, or a canal that has been built up to supplement and join branches of the vast natural canal system. The name of one of the chief towns of Belgium is derived from the circumstance that its streets are, in many cases, watercourses, and that in consequence bridges are more than usually numerous even for a Flemish town. In the pre-railway days, Bruges was reached from Ostend by canal, and the journey has been chronicled, amongst others, by Robert Southey:—

Four horses, aided by the favouring breeze,
Drew our gay vessel, slow and sleek and large,
Crack goes the whip; the steersman at his ease
Directs the way, and steady went the barge.
Ere evening closed, to Bruges thus we came.

Holland possessed in the *Noord Hollandsche Kanaal*—to be noticed more particularly in a later chapter—the broadest and deepest work of the canal kind in Europe, and that work is now surpassed by the new North Sea Canal, designed, like the older work, to improve the water access to the Dutch capital. The older canal, designed by Blanken, and constructed between 1819 and 1825 at a cost of eight million florins, extends from Amsterdam to the Helder. It is calculated that about 5000 sea-going vessels traverse the canal annually, and both the size and the number of the vessels admitted to Amsterdam are expected to increase greatly now that the

deeper and wider, as well as more direct, North Sea Canal has been completed. †

CANALS OF BRITAIN.

It has been held as a reproach on the genius and enterprise of this country that a century should have been allowed to elapse before any effort was made to follow up the example of France in the successful completion of the Canal of Briare and the *Canal du Midi*. If this reproach be deserved, it must at the same time be admitted that when the work was at length taken up, it was pursued with an energy characteristic of the people. Within a period of seventy years, about 2700 miles of canal were constructed, at an expenditure of thirty millions of money. The opening up of the railway system put a stop to the construction of any but ship canals, and probably, had that system been in the smallest degree anticipated to assume the gigantic and masterful position it has since done, some at least of these canals would never have been made.

The effect of the rise of railways in stopping the extension of the canal system, so far as mere inland navigation is concerned, is brought under our notice in a recently published local history, which amongst other interesting information gives us the following:—“The Town Councils of Arbroath and Forfar contemplated a very considerable work in the formation of a canal between the two towns,

to be called the Strathmore Canal. The first survey, which extended from Arbroath to the ruins of Restenneth Priory, was made in 1783 by Mr. Whitworth, C.E. The matter was more thoroughly gone into in 1817, when, at the request of Provost Duncan, Mr. Robert Stevenson, the engineer of the Bell Rock Lighthouse, made a survey. The immediate cause of the scheme being taken up there was the want of fuel in Strathmore from the failure of the peat-mosses, and the great expense of land carriage. Power was to be taken to extend the canal westward to Coupar-Angus and eastward to Brechin. . . . In 1824, the Town Council subscribed £200 for another survey. In the following year they had a report from Mr. Stevenson with regard to a proposal to form a railway from Arbroath through Strathmore, and the canal scheme then finally fell out of sight.” The Dundee and Arbroath railway, though not completed for many years after the time stated in the *History of Arbroath*, was the earliest steam railway in Scotland.

It is curious to remark that the man who did most for the development of the canal system in England, the Duke of Bridgewater, appears to have had a clearer idea in his day of the probable effects railways would have on his canals, than prevailed even sixty or seventy years after, when the invention of the locomotive brought his fears nearer to realisation. In a conversation between him and

Lord Kenyon, the Duke's sagacity in matters connected with his main pursuit is illustrated. "At a period when he was beginning to reap the profits of his perseverance and sacrifices, Lord Kenyon congratulated him on the result. 'Yes,' he replied, 'we shall do well enough if we can keep clear of those confounded tramroads.'" This is probably the same anecdote as is usually current in another form, and which puts the question and answer in this way:—"You must be making handsomely out of your canals?" "Oh yes; they will last my time, but I don't like the look of these tramroads—there's mischief in them."

REMAINS OF ROMAN CANALS IN BRITAIN.

The remains of Roman canals in Britain are the Caer Dyke and the Foss Dyke—the former a cut of about forty miles in length, from Peterborough to the neighbourhood of Lincoln, and the latter about eleven miles in extent, and stretching from Lincoln to the river Trent. It is stated in Camden's *Britannia* that the latter work, of which alone any remains exist, was made by the Romans, and that it was deepened and rendered navigable in 1121 by Henry First. Whether or not it was used by the Romans for purposes of navigation, the use of it for that purpose as early as the twelfth century entitles it to be looked upon as the parent of British canals. In 1762, and again in 1782, Smeaton (who

on the first occasion was associated with another engineer named Grundy) reported upon the Foss Dyke, and on the last occasion the water level (which Smeaton had found to be about two feet eight inches) was raised to three feet six. For a period of fifty-six years nothing further was done, but about 1838, the adjoining "Witham Navigation"¹ having been improved, an engineer was employed to report upon the old Roman work, which he proposed to increase to a depth of four feet, with an alternative plan giving a depth of six feet. In 1840, Messrs. Stevenson were employed to improve the Foss, a uniform width of forty-five feet, with a depth of six feet throughout, being secured, at a cost of about forty thousand pounds. The entrance-lock communicating with the river Torksey was renewed, and pumping apparatus provided to furnish water from the Trent in dry seasons, and thus the old Roman canal, which is properly designated in Brewster's *Edinburgh Encyclopedia* as the oldest artificial canal in Britain, was restored to greater than its original efficiency, and

¹ The water cuts in the Fens of Lincolnshire were termed "navigations." They were primarily made for drainage purposes but converted to canal purposes by sluices at the mouth to keep in the water and keep back the tide when it rose above the desired level. The term is interesting because the men employed in constructing them were called "navigators," and by a natural contraction "navvies," a term afterwards more widely used.

made an integral part of the famous "navigations" of Lincolnshire. For several of the facts here stated we are indebted to the article "Canal" in the *Encyclopædia Britannica*, ninth edition.

EARLY PROPOSALS FOR CANALS.

Britain had allowed France to forestall her in the development of artificial inland navigation, but the idea of following the example of France was not altogether in abeyance during the century that intervened before anything like decided action was taken. In Scotland in the time of Charles II. a scheme was proposed, it is said by James, Duke of York, for the construction of a canal to unite the rivers Forth and Clyde, but the project was abandoned from lack of funds. The idea that London and Bristol might be connected by artificial means was entertained a little earlier. In 1656 a paper was addressed to Oliver Cromwell by a person named Francis Mathew, on the advantage of water communication between those cities. Mathew's plan was to make the rivers Isis and Avon navigable to their sources by means of "sasses," and to connect their heads by a short canal of three miles across the intervening ridge of country. Mr. Hughes, who refers to the paper in his *Memoir of James Brindley*, gives the following quotation from it as illustrative of the state of engineering science in the days

of this projector. His proposal was :—

"To rise as high, in opening the said rivers, as they shall be found feasible ; there to make a wharf, magazine, or warehouse, for all such commodities as are useful to those parts of the country, both for trade and merchandizing and service in time of war with far greater expedition. If any other river practicable for boats lye near the head or side of another river, and that the ground favour the opening of a still river to be drawn between them, it is recommended then to joyn them with sasses or otherwise. But should the ground be repugnant, then a fair stone causey not exceeding one little day's journey for horses or carts to be raised between said rivers. By the like industry many mediterranean passages by water, with the help of such causeys, would be formed from one sea to the other, and not to have the old channel of any river to be forsaken for a shorter passage, for, as hath been said, rivers are never out of their way."

"It is hardly fair," remarks the *Quarterly Review*, "to look down from the height of modern achievement with contempt on a man who, at all events, did his best to call public attention to a neglected subject. Had Mathew succeeded in fixing upon it the vigorous mind of the Protector, his feeble suggestion might have fructified, and Bridgewater and Brindley might have been anticipated by

a century." Other projects to improve river navigation appear to have been made about this period, but the insufficiency and unmanageableness of river navigation made most of such endeavours nugatory. The event proved that there was some truth in Brindley's reported answer before a Parliamentary committee, when asked what he supposed rivers were made for,—“To feed canals.”

The first modern canal made in Britain was the Sankey Brook Canal, which was begun in 1755. This canal is stated not to have been the deliberate design of its promoters, but to have been the result of a sudden change of mind. The projectors went to Parliament for powers to render navigable the brook Sankey, an affluent of the Mersey, which passes the town of St. Helens and traverses a district abounding in valuable coal-beds. On resurveying the ground, it was thought better to desert the line of the stream altogether, and choose a new route. Instead of a “navigation” the work became a canal, and under a second Act of Parliament the work was extended till it reached a length of about twelve miles. This canal proved exceedingly prosperous and useful to the district, and remains a valuable property to this day.

JAMES BRINDLEY.

We now reach the name and the labours of one who by boldness of conception, skill and daring in execution, and confidence in

his own ideas, gave not only the art of canal-making, but the science of engineering in Britain, an impetus and elevation which it has never lost. The life of Brindley is best studied in his works, for apart from them it has little that was distinguished or eventful. The story that he was not able to do more writing than sign his name is now discredited, both on personal testimony and by the production from the office at Worsley of specimens of his handwriting. He was, however, an uneducated man, in the ordinary sense of that term, and though we may not be able to go the length of one biographer who alleges that Brindley's want of education “was alike fortunate for himself, for the world, and for posterity,” there is probably no doubt that his limited range tended to concentration, and to the more complete development of that remarkable genius which created the science of inland navigation in Britain. Of few men can Johnson's lines be more appropriate than of Brindley, though written upon a less noted and less notable man :—

His virtues walked their narrow round,
Nor made a pause nor left a void ;
And sure th' Eternal Master found
The single talent well employed.

If he could write little, he probably spoke less, and this feature has been referred to by Carlyle ; who, in *Past and Present*, has the following characteristic paragraph :—

“The rugged Brindley has little to say for himself ; the rugged Brindley, when difficulties accumu-

late upon him, retires silent, 'generally to his bed;' retires 'sometimes for three days together to his bed, that he may be in perfect privacy there,' and ascertain in his rough head how the difficulties can be overcome. The ineloquent Brindley, behold he *has* chained seas together; his ships do visibly float over valleys, invisibly through the hearts of mountains; the Mersey and the Thames, the Humber and the Severn, have shaken hands: Nature most audibly answers, Yea!"

From another and earlier writer we get a contemporary glimpse of the great engineer. Pennant thus pauses in his *Journey from Chester to London* (1782), to describe the same characteristic as is referred to by Carlyle:—

"It would be ungrateful not to pay some respect to the memory of the great architect and contriver of these works, Mr. James Brindley. That rare genius was born at *Tunsted*,¹ in the parish of *Wormhill*, *Derbyshire*, in the year 1716. His father was a small freeholder, who ruined himself by following the sports of the field, and disabled himself from giving his children any sort of education.

"Young James shewed very early the goodness of his heart, by maintaining the orphan family by such labour as he was capable of. At the age of seventeen he bound himself apprentice to a millwright near *Macclesfield*, when his amazing abilities were soon

discovered. He speedily became a great proficient, and performed a number of things which his master was totally ignorant of. His gratitude was equal to his genius; for he overpaid any instructions he might receive from his master, by maintaining him in a comfortable manner when he grew past working, and fell into distress.

"The first service the public received from him was a very considerable improvement in the paper-press. He got great credit by a water-engine at *Clifton*, in *Lancashire*; and still more by the machinery of a new silk-mill at *Congleton*, to which he gave many most important movements. He highly facilitated the grinding of flints for the potteries; and in 1756 erected a steam-engine on a new plan, by which he reduced consumption of coal to one-half.

"It was a peculiar felicity to the Duke of Bridgewater to find a genius such as *Brindley*, cotemporary to the great designs formed by his grace. That wonderful mechanic naturally fell under the duke's patronage, and was the grand contriver of all the work which his noble friend carried on. Many of his projects were of so stupendous a kind, and so incomprehensible to the vulgar minds, as to subject him to great ridicule, till the scoffers were put to confusion by the successful execution.

"Whenever any great difficulty arose, he constantly took to his bed, excluded all light, and lay in meditation for two or three days, till

¹ The proper name of the place is *Thornsett*, near *Chapel-en-le-Frith*.

he had in idea completed the whole of his plan. A poet would have said he was visited by his muse in those hours of seclusion. *Brindley* certainly was illuminated amidst the darkness by his attendant genius. He reminds me of the younger *Pliny*, who (*Epist. lib. ix. ep. 36*), adopted almost a similar method: '*Clausæ fenestræ manent. Mire enim silentio et tenebris animus alitur. Ab iis quæ avocant abductus, et liber, et mihi relictus non oculos animo sed animum oculis sequor, qui eadem quæ mens vident quoties non vident alia.*'

"When he found his health and faculties to decline, he virtuously determined to extend as far as possible his services, even beyond the grave. He communicated all his plans and designs to Mr. *Hugh Henshall*, his wife's brother, who had been employed by the proprietors, from the beginning, as clerk of the works. His assiduity and abilities seem to have compensated for the loss of his great ally; for the most difficult parts in the undertaking have been successfully executed, since Mr. *Brindley's* death, under the direction of Mr. *Henshall*."

In his apprentice career, and afterwards, *Brindley* gave constant evidence of that natural shrewdness and perseverance which eventually made him distinguished. Mr. *Bennet*, the millwright, was often astonished at the improvements his apprentice introduced into the business, and eventually the customers began to prefer the youth

to his master or any of the journey-men workmen. Before his apprenticeship was out, *Brindley's* master became unable to work, and the apprentice not only kept up the business with credit, but supported the old man and his family in a comfortable manner. In the case of the paper-mill referred to by *Pennant*, *Brindley* saw his master was in a difficulty without sufficient knowledge to solve it, so one Saturday night, after work hours, he set off for the mill, for which the machinery was preparing, mastered all the necessities of the case, and was back in time to begin work on Monday morning, having travelled a distance of fifty miles on foot.

After setting up in business for himself, *Brindley* obtained much distinction by the water-mill contrived to drain the coal-mine at *Clifton* in *Lancashire*. Here, in order to obtain water to drive the engine, he cut a tunnel of six hundred yards long through the solid rock. This was in 1752. Three years later, being employed under an incompetent man in the erection of the new silk-mill at *Congleton*, he encountered the difficulty which for a time obstructed his fame, namely, that he was projecting himself into a profession for which he had not been bred. After *Brindley* had put right some blunders made by his superior, the attempt was made to continue him in the subordinate capacity, but as he resented this, and was found to be indispensable,

matters were put upon their proper footing. Here, in addition to making improvements on the machinery itself, he first introduced some of the beautiful simplifications of labour for which he is renowned. One of these was the cutting of toothed or pinion wheels by machinery instead of by hand as formerly had been done—an advance in method which, it is said, enabled him to turn out as much work in one day as had formerly been possible in fourteen.

BRINDLEY'S FIRST CANAL.

All these subsidiary works and inventions are, however, eclipsed by Brindley's connection with canals, the time for the development of which was now fast approaching. As we have seen, a canal had been made in connection with the Sankey Brook Navigation, in 1755. In 1732, however, the second Duke of Bridgewater had obtained an Act of Parliament for the construction of a canal intended to convey coals from the ducal estate of Worsley to Manchester, a distance of about seven miles. The great outlay, however, and the natural difficulties of the project, caused it to be delayed, and it was left for the son, Francis, the third and famous Duke of Bridgewater, to carry out not only that but much greater works.

The Duke of Bridgewater had heard of Brindley, and asked him to survey the ground for the proposed canal, which he did, inform-

ing his patron that the work presented no difficulties that could not be surmounted. Partly owing to the difficulty of supplying the canal with water, it was determined that it should be level throughout, so that it was carried through hills and over valleys, where, had there been no such difficulty, locks might have been used to accommodate the levels. It started from the bowels of the hill at Worsley, a basin being cut in the heart of the mountain, and the underground works are said to have been in the end extended till they reached a total of more than thirty miles on four different levels within the hill. On leaving the hill, the line of canal was carried on upon an undeviating level, and so complete were the calculations of Brindley and so careful the methods by which he facilitated the work, that it is said by the writer of *The Pursuit of Knowledge under difficulties*, that he "made no blunders, and never had either to undo anything or to wish it undone; on the contrary, when any new difficulty occurred, it appeared almost as if he had been all along providing for it, as if his other operations had been directed from the first by his anticipation of the one now about to be undertaken."

The Barton aqueduct, by which the canal was carried over the Irwell in approaching Manchester, was looked upon last century as an eighth wonder of the world. To us, accustomed to the gigantic enterprises of the railway era, it

seems simply astounding that this little structure of but three arches, and carrying the water-way about forty feet only above the level of the navigable river beneath, should have been reckoned such a marvel. Yet so it was, and it is narrated that Brindley, satisfied that his project would be called in question, asked that another engineer should be called in to examine the place and his plans. The remark of this brilliant ornament of his profession was that he had often heard of castles in the air, but never before was shown where any of them were to be directed. Brindley, however, had perfect reliance on his own proposal, as had fortunately the Duke of Bridgewater in the skill of his engineer, and the aqueduct, begun in September 1760, was opened in ten months afterwards, the first boat passing over the Irwell on 17th July 1761.

On the question of the *originality* of Brindley's mind, the following remarks from the *Quarterly Review* are worthy of quotation :—

“It is perhaps strange that Louis XIV.'s grandiloquent and characteristic proclamation [regarding the *Canal du Midi*], which made so many bosoms beat high, should have had no echo in England. It is, however, far stranger that the example of the great work accomplished in 1681, with its 100 locks, its 36 aqueducts, and its elevation of some 600 feet above the level of the Mediterranean, should for eighty years have

been lost upon England, and that when the hour and the man at last arrived, a scheme more substantial, but far less gigantic, should have been treated as the dream of a madman. We cannot even find that the Canal of Languedoc was ever cited by Brindley or his employer in reply to the wise men who questioned their sanity. It is true that the Canal of Languedoc affords no example of a navigable aqueduct, the piers of which stand in the bed of a navigable river, and constructed on a scale which leaves the navigation of that river impeded ; but even the Pont du Gard might have sufficed to strip Brindley's project of the Barton aqueduct of its supposed impracticability. If Brindley, however, was acquainted with the existence of such works at this period, he was assuredly so ignorant of their details as to be utterly innocent of plagiarism.”

The popular wonder created by the works constructed by Brindley in the Bridgewater Canal found expression in many ways. The *Annual Register* for 1763 contains the following letter, which the editor introduces in terms themselves characteristic of the feeling referred to :—

“*It is with great pleasure that we can, at the head of our article of Projects for this year set one which is an honour to our country, and, indeed, one of the greatest works of the age. It is that stupendous undertaking of an inland navigation, begun and directed by his grace the Duke of Bridgewater.*

"To the Author, &c.

"Manchester, Sept. 30th.

SIR,

"I HAVE lately been viewing the artificial wonders of London and the natural wonders of the Peak ; but none of them gave me so much pleasure as the Duke of Bridgewater's navigation in this county. His projector, the ingenious Mr. Brindley, has indeed made such improvements in this way as are truly astonishing. At Barton-bridge he has erected a navigable canal in the air ; for it is as high as the tops of trees. Whilst I was surveying it with a mixture of wonder and delight, four barges passed me in the space of about three minutes, two of them being chained together and dragged by two horses, who went on the terras of the canal, whereon, I must own, I durst hardly venture to walk, as I almost trembled to behold the large river Irwell underneath me, across which this navigation is carried by a bridge, which contains upon it the canal of water, with the barges in it, drawn by horses, which walk upon the battlements of this extraordinary bridge. This navigation begins at the foot of some hills, in which the duke's coals are dug, from whence a canal is cut through rocks which daylight never enters. By this means large boats are hauled to the innermost parts of those hills, and being there filled with coals, are brought out by an easy current, which supplies the whole navigation for the space of

about ten miles. At the mouth of the cavern is erected a water-bellows, being the body of a tree, forming a hollow cylinder, standing upright ; upon this a wooden bason is fixed in the form of a funnel, which receives a current of water from the higher ground. This water falls into the cylinder, and issues out at the bottom of it, but at the same time carries a quantity of air with it, which is received into tin pipes and forced into the innermost recesses of the coal-pits, where it issues out as if from a pair of bellows and rarefies the body of thick air, which would otherwise prevent the workmen from subsisting on the spot where the coals are dug.

"From Barton I steered my course towards this place, and in my way saw the navigation carried sometimes over public roads, and in some places over bogs, but generally by the side of hills ; by which means it has a firm natural bank on the one side, while the other, composed of earth and gravel thrown up, is about eight yards broad. At proper distances soughs are formed near the top of the canal, which prevents it from overflowing during immoderate rains.

"In some places, where Mr. Brindley has been forced to carry his navigation across a public road, being obliged to keep the water on a level, he has sunk the road gradually, so as to pass under his canal, which forms a bridge over the road ; the carriages, by an easy descent going down on one

side, and by the same easy ascent coming up again on the other. Near this town, where Cornebrook comes athwart the duke's navigation, the current of the brook is stopped, and let into a large bason, from whence it falls gradually into a smaller one, which is within it and is open at the bottom; by which means the water sinks into a drain, and is conveyed underground to the other side of the canal, where it rises into its old channel.

"At this place, which is about a mile from Manchester, the duke's agents have made a wharf, and are selling coals at threepence halfpenny the basket; which is about seven score weight; and next summer they intend to land them in this town.

"Many gentlemen of this neighbourhood are reaping the benefit of Mr. Brindley's invention; he having taught them a method of draining coal-pits by a fire-engine, constructed at the expense of £150, which no one knew before how to make at less than £500. In these he uses wooden chains, which are preferable to iron ones, and cylinders made of deal, which supply the place of those which are usually made of cast iron. Channels are now cutting also in many other coal-pits, and boats are used instead of wheelbarrows to convey the coals to the mouth of the pits; nay, it is even said that some Dutch engineers are coming over hither to perfect themselves in the art of inland navigation.—I am, &c.

"C. S."

Brindley the "ineloquent,"—mute but by no means inglorious,—found many, however, who looked upon his works not with the childish wonder of the foregoing writer,—“almost trembling” to see a barge upon a bridge forty feet high;—but with scorn and incredulity, denouncing his projects as extravagant and impracticable. Great then as was his confidence in the success of the undertaking, it may be taken as an evidence how deeply the unfavourable criticism with which he had been assailed had told upon a nervous and energetic spirit, that when the moment arrived for admitting the water into the Barton aqueduct Brindley's nerve was unequal to the interest of the crisis, so that he ran away and hid himself in Stretford, while Gilbert, the Duke's agent, remained, cool and collected, to superintend the operation which was to confirm or confute the clamour with which the project had been assailed.

In 1762, moved by the success of this canal, the Duke of Bridgewater obtained, though not without much opposition, parliamentary power to continue his canal as far as Runcorn, so as to connect Liverpool and Manchester together by the new method. This brought the first canal up to a total length of about thirty-nine miles, a portion of the work being constructed after Brindley's death, though from his plans. This extension, like the original canal, was kept on one level, crossing the Mersey by a hand-

some aqueduct—though not over a navigable part of that river, and also crossing several valleys in its course. The absence of locks throughout the course of this canal was its characteristic feature; and the estimation in which the work is held, in an engineering point of view, cannot be better expressed than by the writer in the *Quarterly Review*, already quoted, who says that this “uninterrupted level of the Bridgewater Canal from Leigh and Manchester to Runcorn, and the concentration of its descent to the Mersey at the latter place, have always been considered as among the most striking evidences of the genius and skill of Brindley.”

FURTHER ENTERPRISES.

While these canals were in progress, the brother-in-law of the Duke of Bridgewater, Lord Gower—ancestor of the Sutherland family—entered into arrangements with Brindley to survey and plan a canal to unite the Trent and the Severn, and thus to connect the east and west shores of England at a point farther north than the proposal of Mathew in the previous century to connect the Thames and the Avon. This work, the Grand Trunk Canal, excited scarcely less wonder and delight than did the first work of Brindley, and the Harecastle tunnel, a mile and a half long, competed with the Barton aqueduct as a marvel of science and energy. With reference to this work, Pennant says—

“Parallel to my road runs that magnificent enterprise, the canal, for the junction of the eastern and western oceans; designed to give to each side of the kingdom an easy share in the commodities of both. In other countries, the nature of the land permits a ready execution of these designs. *Egypt* and *Holland* are levelled to the workman’s hands. Our aspiring genius scoffs at obstructions, and difficulties serve but to whet our ardour; our aqueducts pass over our once-admired rivers, now despised for the purposes of navigation; we fill valleys, we penetrate mountains. How would the prophet have been treated, who, forty years ago, should have predicted that a vessel of twenty-five tons would be seen sailing over *Stonefield*? Yet such is the case at present.

“Figitur in viridi (si fors tulet) anchora prato.

“This great enterprise was begun on *July 17th, 1766*, near the south end of *Harecastle Hill*, in this county. Its entire length is ninety-three miles, viz. sixty-one miles two furlongs from the south side of that hill to *Wildon* ferry, in the county of *Derby*; and thirty-one miles six furlongs on the north side, to its junction with the Duke of *Bridgewater’s* canal at *Preston on the Hill*, in *Cheshire*.

“To effect this work, there are forty locks on the south side, having in all three hundred and sixteen feet fall; and on the north



side thirty-five, with three hundred and twenty-six feet fall. Six of the most southern locks are fourteen feet wide, adapted for the navigation of large vessels, from opposite *Burton* to *Gainsborough*. At *Middlewich*, on the north side, is another, of the same width.

"The common dimensions of the canal are twenty-nine feet breadth at top; at bottom sixteen; and the depth four and a half, except in the part from *Willen* to *Burton*, which is thirty-one feet broad at top, eighteen at bottom, and five and a half deep. The same is observed from *Middlewich* to *Preston on the Hill*; upon which vessels, capable of navigating in the

estuary of the *Severn*, may pass to the port of *Liverpool*.

"The canal is carried over the river *Dove*, on an aqueduct of twenty-three arches, and the ground raised one mile and two furlongs in length, and to a very considerable height. It is also carried over the river *Trent*, on an aqueduct of six arches, of twenty-one feet span each: and again over the river *Dane* in *Cheshire*, in the same manner, on three arches of twenty feet diameter.

"Besides these, there are near a hundred and sixty lesser aqueducts and culverts, for the conveyance of brooks and streams under the canal; many of which are in

span from twelve to eighteen feet.

"The undertakers, for the convenience of the several persons whose lands they have cut through, or when the canal intersects any public road, have built an hundred and eighty-nine cart-bridges and eleven foot-bridges; and frequently, when the canal passed in sight of any gentleman's seat, have politely given it a breadth, or curvature, to improve the beauty of the prospect.

"The mountains, hills, or rocks, that obstructed the canal, are pierced through in the following places.

"The most southern *tunnel*, as it is called, is at *Hermitage*, where a work is penetrated for the space of an hundred and thirty yards, with a halting-way for horses on one side.

"The *tunnel* through the mountains at *Harecastle*, is cut through a variety of strata and was a work of stupendous difficulty and expense, and executed in a manner worthy of the courage and skill of the great undertaker, Mr. *Brindley*. It passes underground for the length of two thousand eight hundred and eighty yards; is nine feet wide¹ and twelve high, lined and arched with brick. This passes through a country full of coals.

"In *Cheshire*, at *Barnton*, in the parish of *Great Budworth*, is another, five hundred and sixty yards long; at *Saltenford*, in the same parish, is another, three hun-

dred and fifty yards long; and finally at *Preston on the Hill* is another, which passes underground twelve hundred and forty-one yards; each of them is seventeen feet four inches high, and thirteen feet six inches wide: after that, at *Preston on the Hill* it emerges, and soon concludes its course, by falling into that formed by a useful peer, the Duke of *Bridge-water*; which drops into the *Mersey* at *Runcorn*, with a fall of eighty-two feet, eased by ten magnificent locks.

"From *Middlewich* to *Manchester* is a dead level, which does not require a lock in all that space.

"The proprietors of this great work have employed on it about fifty boats, exclusive of those belonging to other persons which amount at least to the same number. They are calculated to carry twenty-five tons each; are drawn by one horse, for which the proprietors receive *per mile* three halfpence a ton."²

In a newspaper of the time a writer has given a good personal description of *Brindley* as well as a graphic picture of the wonder with which these works were regarded while in progress. He says, "Gentlemen come to view our eighth wonder of the world, the subterranean navigation which is cutting by the great Mr. *Brindley*, who handles rocks as easily as you would plum pies, and makes the four elements subservient to his will. He is as

¹ The width here mentioned was subsequently doubled by *Telford*.

² *Journey from Chester to London*, 1782.

plain a looking man as one of the boors of the Peak, or one of his own carters; but when he speaks all ears listen, and every mind is filled with wonder at the things he pronounces to be practicable. He has cut a mile through bogs, which he binds up, embanking them with stones which he gets out of other parts of the navigation, besides about a quarter of a mile into the hill Yelden, on the side of which he has a pump which is worked by water, and a stove the fire of which sucks through a pipe the damp that would annoy the men who are cutting towards the centre of the hill. The clay he cuts out serves for brick to arch the subterraneous part, which we heartily wish to see finished to Wilden Ferry, when we shall be able to send coals and pots to London and to different parts of the globe."

It is impossible to describe in detail the growth of the canal system designed by Brindley and his successors. The extent of canal designed by Brindley is stated to be 361 miles, but the whole of the work was not completed in his lifetime. By means of his two canals, the Bridgewater and the Grand Trunk, with the Birmingham and Worcester Canal, and the Grand Junction, the four leading ports in the kingdom—London, Liverpool, Bristol, and Hull—are brought into direct communication, an end which Brindley had early aimed at though he did not live to see it accomplished. So widespread did

the ramifications of the system become, that it is stated there is no place in England, south of county Durham, that is farther than fifteen miles from water communication.

GENERAL SUMMARY OF CANALS IN ENGLAND.

The following summary of the condition of the canal system of England is given in M'Culloch's *British Empire*:—"The navigation from the Mersey to the Humber, by the Grand Trunk Canal, is very circuitous and tedious. But other and shorter lines of internal navigation have since been opened between them, and which connect, in fact, all the great manufacturing towns of Lancashire and of the West Riding of Yorkshire with each other and with the ports of Liverpool and Hull. The first constructed of these lines stretches, by a route 130 miles in length, from Liverpool, by Skipton, to Leeds, where it joins the Aire and Calder navigation. This canal was begun in 1770, and was the boldest and most magnificent project of the sort that had been then attempted. It took 46 years to complete, and cost in all about £1,200,000. The original line, which had been approved by Brindley, was, in several instances, departed from in the course of the work. The depth of water is about five feet. Notwithstanding its vast expense, and the competition of other lines, it has become, contrary to what

was long anticipated, a profitable project for the subscribers. More direct channels of communication, joining the Mersey and Humber, have since been carried across the great central ridge, or high grounds between Lancashire and Yorkshire, by the Rochdale and Huddersfield canals. The summit-level of the latter, at the tunnel where it is carried under Standege Hill, is 656½ feet above the level of the sea, being the highest elevation of any canal in the kingdom. The tunnel referred to is 5451 yards, above 3 miles, in length.

“Exclusive of the communication, already noticed, between the Thames and Severn, these two rivers are directly united by three different lines of navigation. Of these, the most northerly is the navigation from Oxford to Lechdale, by the Isis; and from Lechdale to Stroud on the Severn, by the Thames and Severn Canal. The next, or middle navigation, is by the Wilts and Berkshire Canal, from Abingdon on the Thames to near Melksham, where it unites with the Kennet and Avon Canal, extending to Bath and Bristol. The last or most southerly line leaves the Thames at Reading. It consists partly of the river Kennet navigation, and partly of the Kennet and Avon Canal, now mentioned. This last is the most direct line of communication by water between London and Bristol; and is the channel by which most part of the bulky articles passing from

the one to the other is conveyed. Owing, however, to the heavy cost of its construction, the Kennet and Avon Canal has not been profitable for the undertakers. It is 57 miles in length; its summit-level is 474 feet above high-water mark, and it has a minimum depth of five feet water. Few canals exhibit so many specimens of aqueducts, tunnels, and deep cutting.

“In addition to the above, an immense number of other canals have been constructed at different periods, some of which are of great magnitude and importance; so that England now enjoys an extent of canal navigation amounting in all to above 2400 miles, and unparalleled in any other European country with the exception of Holland. Few of the English canals are above seven or under four feet in depth. The Gloucester and Berkeley Canal is, however, 18 feet deep, and vessels of 400 tons are consequently enabled to reach Gloucester by its means.”

CANAL TUNNELS.

It may give a good idea of the extent of the difficulties overcome in making these canals to read a list of the principal canal tunnels existing in England in 1830.

The first tunnel of this kind in England was on the Trent and Mersey Canal, executed for the Duke of Bridgewater. It is about 2880 yards in length, and some parts cut out of the solid rock.

The canal, in its 93 miles of length, has four other tunnels—131, 350, 573, and 1241 yards.

The Worcester and Birmingham Canal, of 29 miles in length, has five tunnels: one of 2700 yards long, 18 feet high, and $18\frac{1}{2}$ feet wide; and four others—110, 120, 400, and 500 yards long.

The Leeds and Liverpool Canal has two tunnels, one of which is 1530 yards.

The Leicestershire and Northampton Canal has four tunnels, of 286, 880, 990, and 1056 yards.

The Leominster Canal has two tunnels, of 1250 and 3850 yards.

The Thames and Severn Canal has one tunnel of 4300 yards, or two miles and 3-8ths.

The Chesterfield Canal has two tunnels, one of which is 2850 yards in length.

The Crumford Canal has one tunnel of 2966 yards, and several smaller.

The Doudley and Owen Canal has three tunnels, of 623, 2926, and 3776 yards, or about four miles in all.

The Ellesmere Canal has two tunnels, of 487 and 775 yards.

The Hereford and Gloucester Canal, of $35\frac{1}{2}$ miles, has three, of 440, 1320, and 2192 yards.

The Edgebarton Canal has four tunnels, of 100, 400, 500, and 2700 yards.

The Birmingham Canal has two tunnels, one of a mile and a quarter, the other 1000 yards.

The Grand Union Canal has two tunnels, 1165 and 1524 yards.

The Grand Junction Canal has two tunnels, 3045 and 3080 yards.

The Oxford Canal has two tunnels, one of them 1188 yards.

The Huddersfield Canal, of only $19\frac{1}{2}$ miles long, with a lockage of 770 feet, has a tunnel of three miles and 1540 yards through a rocky mountain.

Pennant has left an interesting picture of the results of these great works upon the England of his day, with more particular reference to the canals connecting the chief ports of the kingdom. In his *Chester Journey* he thus writes:—

“Notwithstanding the clamors which have been raised against this undertaking, in the places through which it was intended to pass, when it was first projected, we have the pleasure now to see content reign universally on its banks, and plenty attend its progress. The cottage, instead of being half-covered with miserable thatch, is now secured with a substantial covering of tiles or slates, brought from the distant hills of *Wales* or *Cumberland*. The fields, which before were barren, are now drained, and, by the assistance of manure, conveyed on the canal toll-free, are clothed with beautiful verdure. Places which rarely knew the use of coal are plentifully supplied with that essential article upon reasonable terms; and, what is still of greater public utility, the monopolizers of corn are prevented from exercising their infamous trade; for, the communication being opened be-

tween *Liverpool*, *Bristol*, and *Hull*, and the line of the canal being through countries abundant in grain, it affords a conveyance of corn unknown to past ages. At present, nothing but a general dearth can create a scarcity in any part adjacent to this extensive work.

"These, and many other advantages, are derived, both to individuals and the public, from this internal navigation. But when it happens that the kingdom is engaged in a foreign war, with what security is the trade between those three great ports carried on; and with how much less expense has the trader his goods conveyed to any part of the kingdom, than he had formerly been subject to, when the goods were obliged to be carried coastways, and to pay insurance?

"I believe it may be asserted, that no undertaking, equally expensive and arduous, was ever attempted by private people in any kingdom; and, in justice to the adventurers, it must be allowed that, considering the difficulties they met with, owing to the nature of the works, or the caprice of persons whose lands were taken to make the canal, that ten years and a half was but a short time to perform it in; and that satisfaction has been made to every individual who suffered any injury by the execution of the undertaking. The profits arising from tonnage are already very considerable; and there is no doubt but they will increase annu-

ally; and, notwithstanding the enormous sum of money it has cost in the execution, the proprietors will be amply repaid, and have the comfort to reflect, that, by the conclusion of this project, they have contributed to the good of their country, and acquired wealth for themselves and posterity."

It is always useful, with reference to anything in one's own country, to know "how it strikes a stranger." The two opinions following, being those of intelligent foreigners at a time fifty years later than Pennant, and when as yet canals had not lost their importance, give a favourable estimate of the structure and results of the canals of England, a conviction of the truth of which would have been doubtless satisfactory to many who had sunk their capital in such undertakings.

The first is from Count Pecchio, an Italian who visited Britain in 1833, and who published a work, *The Italian Exile in England*:—

"All the canals, which in England are innumerable, were constructed by companies, of which there have been more than fifteen within the last sixty years. These have dug and opened canals in every direction, on the faith of the toll they were to be allowed to take. The shareholders have gained almost double the usual rate of interest; commerce an increased facility, and a great saving of time; the public a great convenience; and the whole country incalculable wealth."

The view taken by Baron d'Haussez, a member of the suite of Charles X., who published his impressions of Great Britain about the same time, is hardly less flattering or more delusive :—

“England is completely intersected by water communications. Some of these are destined to carry on the trade of the capital with the commercial and manufacturing towns, others to communicate from one country to another. To these vast ramifications numerous smaller canals are attached. These latter serve for the transport of the produce of coal-mines or manufactories, or for local wants ; they are always proportioned to the exigency for which they have been created. When the boats which ply on them reach the larger canals or rivers, they are chained together, and arrive thus at their destination without the necessity of transshipments, which would occasion expense, a great loss of time, and the deterioration of the merchandise.

“Nothing is simpler or more economical than the plan adopted for the construction of canals. In order to avoid the risking of considerable sums on enterprises the result of which would be uncertain, a provisional character is given to the work. Narrow dimensions, sluices and bridges of wood, the substitution of inclined planes for sluices, the interruption even of the canal itself, and the adoption of land-carriage when serious difficulties intervene, which

could not be overcome without heavy expense,—these are the expedients adopted in England, expedients which would be utterly rejected in a country like France, where nothing is admitted which has not a durable and monumental character. This will explain the multiplicity of this kind of enterprises in one country, and their extreme rarity in the other.

“Thanks to this wise system of proceeding, public prosperity, in England, spreads and penetrates everywhere by the aid of channels which she knows how to open, without display, without ostentation, almost without attracting notice. All this is achieved by a combination of private interests, that powerful engine which is employed as a balance to weigh the considerations for and against the realisation of the project, and, at the same time, as a lever to remove the obstacles which would oppose its completion.”

CANALS IN SCOTLAND AND IRELAND.

The principal canals in Scotland fall more properly to be considered under the head of ship canals—that is to say, canals not primarily designed to increase the facilities for inland communication, but for the use of sea-going vessels and to shorten a sea voyage. The first canal made in Scotland—that between the Forth and Clyde—was of this character, although eventually the completion of the Union Canal to Edinburgh, and a cut to

Glasgow brought it also under the category of inland canals. The Monkland Canal from Glasgow to the iron districts is also in communication with the Forth and Clyde, though itself an inland or barge canal. Chronologically the first work of the kind made in Scotland was the canal connecting the Forth and Clyde. The proposal to construct this work was first made in the seventeenth century, and was renewed in 1722 and 1760. The first portion of the canal was cut in 1766, but the work was suspended for a time, and the communication from sea to sea was not completed till 28th July 1790. The line of this canal is interesting in respect that it follows very nearly that of the Roman wall of Antoninus. Being intended for the use of sea-going vessels it is on a larger scale than most of the canals in England, admitting vessels drawing $8\frac{1}{2}$ to 9 feet, while the locks accommodate vessels of 73 feet keel. The work was one of considerable difficulty, embracing numerous bridges and embankments, and having in its course of 39 miles no less than 39 locks, namely 20 on the eastern declivity and 19 on the western, with a total rise of 156 feet above the sea-level. The next canal to be constructed in Scotland was the Caledonian Canal, which will fall to be noticed under a subsequent head, as will also the Crinan Canal across the promontory of Kintyre. It may however be remarked in regard to these two works that, while the great increase

in size of sea-going vessels has rendered them in a great measure unsuitable for the purpose for which they were primarily designed, they present now a more direct connection with "Traveling," than almost any canal originally designed to expedite conveyance from town to town.

In 1807 a canal intended to connect Glasgow with the port of Ardrossan was begun, but the work was not carried farther than the town of Johnstone. A canal of $18\frac{1}{2}$ miles long was begun in the same year between Aberdeen and Inverurie. This last-named canal was remarkable for its numerous locks, aqueducts, and bridges; as in its brief course it was crossed by 56 over-bridges and passed over 5 aqueduct bridges, while 20 culverts were provided to carry streams under its embankments. It had also 17 locks reaching 160 feet above the level of the sea. This was never a very prosperous undertaking.

The Union Canal, from Edinburgh to a junction at "Lock 16" with the Forth and Clyde Canal, was completed in 1822 under an Act of Parliament obtained in 1816, the first boat, laden with "flags" from Denny, passing on 4th May 1822. "No public useful work," says *Chambers's Gazetteer of Scotland*, "ever met with such opposition as this. It had for its object the importation of coal from the western districts to the metropolis, from which that article had hitherto been excluded, to the benefit of the monopoly of the Mid-Lothian coal proprietors."

The cost of the work was very great, in consequence of the expenditure in constructing two fine aqueducts over the Water of Leith at Slateford, and the river Avon at Linlithgow. The bridge at Slateford is 65 feet high—nearly double the height of the Barton aqueduct, the “eighth wonder of the world,” of sixty years before—and 500 feet in length; while the bridge over the Avon exceeds these dimensions, being 80 feet in height. Near Callander House the canal passes through a tunnel three furlongs in length. It meets with no lock until its junction with the Forth and Clyde Canal, but its level character throughout is gained at the sacrifice of distance, the length of canal being 31 miles to cover a distance not much exceeding 20 miles as the crow flies. This has, perhaps, been one of the most unfortunate canals made in this country, and few public works of the kind have so grievously belied the expectations of its promoters. Its original estimated cost was £235,167, while the revenue was estimated at £55,000 a year. The actual expenditure upon the work amounted to £600,000, while the revenue scarcely amounted to one fourth of the sum expected. If the profits had been realised in accordance with the prospectus, the whole capital would have been repaid to the shareholders by 1828, whereas up till that time the whole amount available as dividend did not reach £4000, and even this sum was not divided, for as the original £50 shares were increased

by allocation to £96, those shareholders who had not been able to pay up the additional capital could receive no dividend until the amount due on the shares was paid up. These miserable results formed a striking contrast to the great expectations that had existed ten years before, up to which time a kind of mania for canal-making appears to have prevailed. We have a curious glimpse of this mania in Mr. Robert Reid's interesting work on Glasgow, published in 1864, when the writer was 92 years of age. He tells us that “towards the close of last century the Philosophical Society of Glasgow issued a proposal to make the Molendinar burn navigable up to the Gallowgate bridge; and if the mania for joint-stock companies with limited liability had then been as rife as we have seen them (*sic*) of late, we might perhaps have beheld a little Broomielaw in the Gallowgate, with its upper and lower navigation.”

At the time when the Union Canal was projected, many projects were being brought before the public for the construction of canals. In 1817 proposals were issued for a canal between Carlisle and the “West Sea,” and for a canal to connect the eastern and western Sea. The subscription for both was pretty well filled up, and the latter was determined to be made as far as Hexham. This was the same year in which the subscription for the Union Canal was completed, and a year before the town of Leith presented a very

humble petition to Edinburgh, its superior, protesting against the abandonment of the proposal to extend the canal then to be made from Edinburgh to Glasgow, to the sea-port. "Utter ruin," or at least great evil to Leith, was predicted as likely to result from this change of plan ; and looking at the case with the eyes of 1816, it would seem to have been better for the canal as well had it reached the sea. But viewing the circumstances as we are now enabled to do, the intense solicitude of the inhabitants of the flourishing *railway* port (as it now is) is apt to provoke a smile.

The canals of Ireland are, as may be expected, very curious in their history and questionable in their success. The Grand Canal, a subscription undertaking, was begun as early as 1756, and reached its completion so late as 1829, the total expenditure upon it having reached about two millions. Starting from Dublin, it traverses the heart of Ireland, joining the Shannon at a place called Banagher. It appears to have been designed on altogether too extensive a scale, the locks, 70 feet long, being very nearly as large as those on the ship-canal between the Forth and Clyde in Scotland, while the proper object of a ship-canal, that of saving a long sea-voyage, can hardly be said to exist as regards Ireland. The depth, however, is only about six feet, and the opinion was entertained, long before the canal system was practically superseded,

that a lesser depth than that would have greatly reduced the cost. The Grand Canal, including all its branches, extends to 164 miles. Not less remarkable than the excessive bigness of the ideas of its promoters was the want of judgment as to its course. Instead of joining the Shannon about fifteen miles above Lough Derg, it should have joined it below Limerick. The advantages of this would have been three-fold, avoiding the difficult and dangerous navigation of the Shannon, traversing a more fertile region of the country, and avoiding the Bog of Allen, in which, as Wakefield remarks in his *Account of Ireland*, the company "buried more money than would have cut a spacious canal from Dublin to Limerick." Although very expensively made, and very unprofitable, this canal beneficially promoted the commercial condition of Ireland.

Also connecting Dublin with the Shannon is the Royal Canal, 92 miles long, with locks 81 feet long, reaching an elevation of more than 300 feet above the level of the sea, and costing about a million and a half of money. Over a great part of its course it is nearly parallel with the Grand Canal, so that, as M'Culloch observes, there are two immense canals where there ought perhaps to be none ! The last-named writer describes a portion of this canal from personal inspection. "It did not appear ever to have been made any use of. The water in it was quite pure, except that in some places

it was full of aquatic plants. The locks were very much decayed ; and had generally on the one side a dyke of turf, constructed by the country people to facilitate their passage across the canal !" In 1836 this canal produced a net revenue of £13,236, or rather less than one per cent upon its cost.

The other Irish canals are the Limerick Navigation, begun in 1767, and described as both costly and defective ; the Barrow Navigation, joining the Barrow with the Grand Canal, and reported upon as so defective both in execution and design, as to consume in maintenance and repair the greater part of any revenue derived from it ; the Boyne Navigation, "badly executed and very unprosperous ;" the Newry Navigation, begun in 1739, executed at the public expense, and described also as "very defective ;" and the Laggan Navigation, costly, very defective and unprofitable !

This picture is a truly lamentable one, and contrasts in a striking degree with the purpose-like, and, in the main, prosperous condition of the English and Scotch canals. Quoting Arthur Young's saying that "a history of public works in Ireland would be a history of jobs," McCulloch says, "The canals that have been constructed in that country seem completely to verify that caustic remark. Immense sums of money have been lavished upon them, to very little purpose except the enriching of contractors ; and it

is not easy to say whether the ignorance displayed by the greater number of the projectors, the waste of public money by which they have been for the most part characterised, or their inutility, be their most prominent feature."

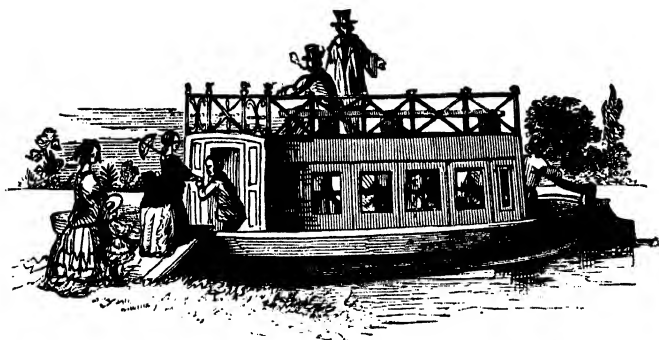
The reader of this description of the canals of Ireland will not fail to contrast it with the notice of the private enterprise in the way of travelling appliances described in a previous chapter. The genius and business energy of Bianconi enabled his little cars to outstrip in usefulness and profitability these gigantic works. The canals scarcely succeeded even in providing profitable labour for the people, though the expenditure in the Bog of Allen, for example, might have saved the canal system of Ireland from the curious objection brought against it by the Duke of Richmond, who, in a letter on the Irish canals in the year 1808, thus discusses and disposes of an argument advanced in favour of canals as a means of giving employment to the people of Ireland :—

"If the object be to prevent idleness and all its consequent evils, the same thing might be effected by filling them up again, or conveying the produce of Ireland from one place to another in wheelbarrows ; the fact is, that cutting canals is not a regular, permanent, and profitable employment. One of the chief objections to canal-making is that it creates for a multitude of persons

a temporary employment which cannot be continued."

In opposition to this opinion it may be noticed that when the Caledonian Canal was finished in 1822, the *Edinburgh Courant*, in noticing the work, made the em-

ployment it had afforded to the people one of the strongest grounds of congratulation. The contrast between the philosophy of the one view and the discontent of the other is characteristic and suggestive.





CHAPTER II.

That lagging barks may make their lazy way,
Ah ! grievance sore and listless dull delay.

Childe Harold's Pilgrimage, li. 20.

RESULTS OF CANAL ENTERPRISE—A CANAL JOURNEY—SPEED OF THE
JOURNEY—AMENITIES OF CANAL TRAVELLING—CANAL SCENERY—
DANGERS OF CANAL TRAVELLING—EXISTING PASSENGER BARGES.

RESULTS OF CANAL ENTERPRISE.

BEFORE proceeding to notice the later and greater canals—those ship canals that now form so prominent a feature in all our reading about ocean travelling and over-sea commerce—it will be of interest to gather a few particulars of the nature and cost of the transit upon barge canals made for inland navigation, and of the pleasure or discomfort of a mode of travelling which is now completely a thing of the past. Here again it is very desirable to keep in mind that it is only as regards passenger travelling that our inland canals have ceased to be of importance. From the first, the use of the canal for transmitting merchandise was an object of greater importance to the projectors than the conveyance of passengers, and now, when the latter is at an end, and the mind of the general public is thus drawn away from the extensive trade still carried on by canal, one is apt to overlook the fact that a very

considerable number of people are still engaged upon the canals, and that the social condition of the “barge population,” as regards education, hygiene, and moral standing, is a problem anxiously studied by numerous public men, and which has frequently of late been brought under the notice of Parliament.

The commercial results, then, of canals may very fitly occupy attention before speaking of these works from a passenger point of view. An immediate result of the opening of the Bridgewater Canal to Liverpool, for example, was a reduction in the cost of transmitting goods. The usual price before the opening of the canal had been 12s. a ton by water carriage—that is, by the slow and uncertain navigation of rivers, subject to all the changes of floods and droughts—and 40s. a ton by land carriage. Goods were conveyed by the new canal at a charge of 6s. a ton, with speed

and regularity exceeding that of land carriage.

From a book written in 1810 we learn that the freight of a ton of coal, of 36 bushels, was about twopence per mile, and so in proportion for other things; wheat from Norfolk which is a corn country, to Liverpool which is not, cost for carriage about 9s. 2d. the quarter of eight bushels, while by sea it would have cost 13s. 3d. or, without insurance, 11s. The toll, this writer adds, yielded to the stockholders generally seven or eight per cent, and they were restricted to a certain maximum of profits. The canal proprietors strove hard to maintain their ground against the railways on the ground of greater cheapness, but except in regard to bulky and weighty articles they eventually suffered. It may be interesting to reproduce some of the arguments by which it was sought to preserve for the canals the same advantages over the railway as they had undoubtedly enjoyed, for goods, and in some instances for passenger traffic, over the road conveyances. When a railway, or, to speak more correctly, two competing designs for railways, were projected between Edinburgh and Glasgow, the proprietors of the Union Canal, then eight years opened, argued against the project both in their annual and in special reports. In one part of the annual report of the company for 1830 it is said—

“One of the principal advantages of railways is *celerity*; but although this may be of special

advantage to travellers, yet in the conveyance of coal, and many other articles, it is of comparatively little consequence;—*cheapness* as regards them is the grand *desideratum*,—an object which, we presume, may be accomplished by a canal not less than by a railway.” And they do not hesitate even to put one canal against another to prove their case, for while admitting that Brindley’s canal from Manchester to Liverpool was circuitous and tedious, and consequently might be more successfully opposed by a railway, they proceed to argue in the following way:—

“The communication between Edinburgh and Glasgow by means of the canals does not labour under any such disadvantages. Though it is no longer than the communication by the common road or than it may be by a railway, yet the difference is by no means so great as between the Liverpool water conveyance and the Liverpool Railway. Neither does it require on an average 36 hours to convey goods by it: they leave Edinburgh in the evening, and are delivered in Glasgow next forenoon; so that, as they proceed during the night, comparatively little time is lost. Nor is the conveyance of goods liable to that uncertainty which is experienced between Liverpool and Manchester, for as no part of the passage is by water subject to wind and tide, the time may ordinarily be depended upon, unless in storms of frost and snow,—a casualty to which railways are much more

liable than canals. To all this it may be added, that notwithstanding the statements which are given of the cheapness of railways for the conveyance of passengers and goods, this has still to be proved ; as yet it is even scarcely matter of experiment. If we take into account, not only the original expense of such undertakings, but the great expense on account of locomotive engines (a single locomotive engine of ten horse-power being estimated by Mr. Rastrick to cost not less than £367 : 4 : 4 per annum) the tear and wear of waggons, and of the railroad, etc., it appears natural to conclude that the cheapness will be in favour of canals, especially when celerity is not required. It is a well-known fact, that a good horse on a level railway can draw only about eight or ten tons, whereas on a canal a very indifferent horse can draw fifty tons in a clumsy, ill-constructed boat ; but in a well-constructed iron boat it can draw sixty-five tons in addition to the boat. A horse thus draws from 5 to $6\frac{1}{2}$ times as much on a canal as on a railway ; and if steam, or any other power, is substituted in both cases, the result will probably be in a similar proportion in favour of canals. The expense, too, of the tear and wear of waggons on a railway is far greater than of boats on a canal."

All such speculations read curiously now in the light of half a century's experience of railways !

The act for the Liverpool and Manchester Canal was only ob-

tained after serious opposition, chiefly coming from persons interested in the existing means of transit ; and sixty years later, when the Union Canal was proposed to be brought into Edinburgh, the Mid-Lothian coal-owners endeavoured to thwart a proposal which brought a dangerous rival into a market of which they had previously had the monopoly. A remnant of this state of antagonism, and of the efforts to introduce to public favour the new fuel which had so decidedly helped to reduce the price, was long preserved in the city of Edinburgh, where coal-hawkers, with stentorian voices, were heard in every street of the Old Town calling "Canal Coal" for sale. Nominally, the calling of coal is prohibited in Edinburgh, but we believe it is only nominally prevented, and it is said that the word "coal" only now is called out, the canal being in fact practically driven out of the coal-trade by the railway, and the latter bringing coals with remarkable impartiality from any or every direction.

The canal system had other opposition to endure, much as the railway system subsequently had, from the dislike of proprietors to have their land interfered with. And to complete the parallel, it may be noticed that, in the end, the opening of the works was found to benefit the adjacent property, whether in lands or houses. Two brief illustrations of this may suffice taken from Mr. Robert Reid's interesting personal reminiscences of last century :—

"Mrs. Fleming, a very clever and acute old lady, was in a mighty passion," he informs us, "when she heard that the Forth and Clyde Canal was to be cut through the very middle of the family lands, thereby cutting the family farms in halves, and forcing the tenants to cross the canal on every occasion when they required to plough or dress the respective detached parts; but the old lady lived to change her opinion on this subject, when she found that, so far from the canal having injured the value of the family lands, it had tended to increase the same to an extent quite beyond all expectation." And he quotes a newspaper advertisement which shows that the advantages of vicinity to a leading means of communication were well understood. This advertisement, which is taken from the *Glasgow Journal* of 1st July 1779, refers to lands and houses to sell, and concludes as follows:—"The above lands lie along the east side of the high road leading from the city of Glasgow, to the basin at the west end of the Great Canal, and by their vicinity to the canal, being within 160 yards of it, may be of great advantage to an active tenant."

A CANAL JOURNEY.

There was nothing very heroic or exciting about a journey upon a canal, and possibly there is no method of travelling upon which so little has been written in the

way of personal reminiscence. One explanation of this is that the passenger boats on our canals, even when the so-called "Swift Boat" was introduced, or even in the rare cases where steam barges were effectually used, never commended themselves to the wealthier and the better educated, that is to say, to the book-writing class. The more reserved post-chaise, or the swifter mail (when the latter came to be at its best), was more attractive than the narrow, confined, and, in every sense, slow canal boat. The first point that attracts our attention is the nature of the boats themselves. They were not things that might, like sedan chairs or state carriages, be preserved in our museums, and it is hardly possible to point to any existing vessel from which a conception of the canal passenger boat of last generation can be obtained. There are a few of the old barges still doing duty on canals as boat-houses and "head quarters" for some of the rowing clubs that disport themselves on the almost disused reaches of our canals, what was formerly the open part of the boat being floored over to serve as a jetty from which the oarsmen can step into their outriggers, and the interior—the old "cabin" and "steerage"—serving as dressing rooms, etc.

In the absence of more detailed reminiscences, it is interesting to catch a glimpse of what were the actual accommodations furnished for the passenger to induce him to

embark in a canal. The fares charged a century ago for travelling upon the Bridgewater Canal seem to have been moderate, and it will probably be read with some surprise that the passenger boats of that day were provided with the accommodation of a refreshment room. The *Annual Register* for 1774 supplies the following:—

“The Duke of Bridgewater has just built two packet-boats, which are every day towed from Manchester to Warrington; one carries six score passengers, the other eighty. Each boat has a coffee-room at the head, from whence wines, etc., are sold out by the captain’s wife. Next to this is the first cabin, which is 2s. 6d.; the second cabin is 1s. 6d.; and the third cabin, 1s., for the passage or voyage upon the canal.”

The following advertisement appeared in the *Glasgow Mercury* of 9th October 1783:—

“To merchants, grocers, agents, shipmasters or others, who have occasion to transport goods, or to be accommodated as passengers through the Forth and Clyde Navigation. The proprietors of the canal, wishing to establish a system of facility and despatch calculated to render this conveyance as secure and certain as a stage waggon, have built and completely fitted two stage vessels, to ply constantly upon the canal. The burden of each is about 50 tons, and these vessels are constructed to carry both goods and passengers, and to track through in one day. Apartments are fitted

up commodiously for both cabin and steerage passengers, and every species of goods, excepting grain in bulk, will be received and carefully shipped and unloaded by Andrew French at the West Basin, and Alexander Carrick at Sea Lock, Bainsford, and Camelon. For safety, care, and attention, the proprietors are responsible. The track boat ‘Glasgow’ will begin her first periodical trip on Monday the 20th instant, at seven o’clock in the morning. Cabin passengers will be conveyed at the moderate rate of 2s., or 1d. per mile in full; steerage passengers to pay only 1s. or $\frac{1}{2}$ d. per mile in full, and both to be allowed 40 lbs of luggage. *N.B.*—All passengers going to Glasgow will be landed at the West Basin, and those going east will be landed at Camelon, near Falkirk, if desired, from which, if proper encouragement is given, it is expected stage coaches, caravans, and waggons will probably be established to convey passengers, with parcels and other goods, at a low rate, by land carriage to Edinburgh.”

After a lapse of fifty years, when the passenger boats were beginning to fight for their lives with the “tramroads” whose opposition the Duke of Bridgewater foresaw, the fares seem to have remained very much the same as in these advertisements. The following from a letter addressed to “Canal Proprietors and Traders” in 1831, puts the best possible face on the amenities and comforts of canal travelling, and also gives a good

idea of the fares charged and the speed attained about that time :—

"The boats are more airy, light, and comfortable than any coach. They permit the passengers to move about from the outer to the inner cabin; and the fares per mile are one penny in the first, and three farthings in the second cabin. The passengers are all carried under cover, having also the privilege of an uncovered space. These boats are drawn by two horses, the prices of which may be from £50 to £60 per pair, in stages of four miles in length, which are done in from twenty-two to twenty-five minutes, including stoppages to let out and take in passengers, each set of horses doing three or four stages alternately each day. In fact, the boats are drawn through this narrow and shallow canal at a velocity which many celebrated engineers had demonstrated, and which the public believed, to be impossible." The same document gives a description of the form, capacity, and material used in the construction of passenger boats. They are stated to be "70 feet in length, about $5\frac{1}{2}$ feet broad, and but for the extreme narrowness of the canal might be made broader. They carry easily from 70 to 80 passengers, and when required can and have carried upwards of 110 passengers. The entire cost of a boat and fittings is about £125. The hulls are formed of light iron plate and ribs, and the covering is of wood and light oiled cloth."

SPEED OF THE JOURNEY.

Speed is so much a relative term, that one accustomed to the high-pressure travelling of the present day, would almost be disposed to use some other word in speaking of the rate of progress upon a canal. From the very earliest time of their introduction, efforts were made to introduce steam for the propulsion of canal boats, and in the history of steam navigation, in a subsequent section of this volume, this will be more fully referred to. It is, however, of interest, under this branch of travelling, to indicate briefly what was done in this way. The first experiment was made with Symington's boat in 1789, on the Forth and Clyde Canal. This was in October, when the boat, having an engine on board that had been made at Carron Works, "glided along propelled at the rate of nearly six miles an hour." It was ten years afterwards that the famous *Charlotte Dundas* was begun, and in March 1802 this vessel, taking in tow two vessels of 70 tons each, performed the journey to Glasgow— $19\frac{1}{2}$ miles—in the teeth of a head wind before which no other vessel on the canal attempted to move to windward. Steam-tug experiments were made on the Bridgewater Canal between 1796 and 1799, but were less successful. Captain Shanks, R.N. from Deptford, was at Worsley many weeks preparing for it, by the Duke of Bridgewater's own orders, and under his own eye.

It was set in action and tried with coal-boats; but it went slowly, and the paddles made sad work with the bottom of the canal, and also threw the water on the bank. The Worsley folks called it Buonaparte. It may be presumed that the failure was complete, for no second trial appears to have been made. Eight coal-boats of 25 tons each were, however, dragged to Manchester at a little more than a mile an hour. A similar experiment was made on the Sankey Brook Canal in 1797, when a loaded barge was worked up and down by a steam engine for twenty miles, "but singular as it may appear," says Mr. Priestley, "vessels have continued on this canal to be towed by manual labour."

The real objection to the use of steam power on a canal was the wasting of the banks; and so long as things remained moderately successful, the proprietors were content with horse-haulage. Between 1820 and 1830, the growing speed of the well-appointed mail coaches, and the threatening position of railways, caused the subject to be more narrowly studied, and the result was a considerable increase in the speed of canal boats, and the revival of the experiments with steam power. Great things were expected from the discovery of the fact, that not only less fatigue to the horses, but less injury to the banks, ensued from a speed of ten miles an hour than from a speed of six miles.

The experiments on passage

boats by which this fact was proved were gone into, we are told, in consequence of the revenue from them having progressively fallen off for several years, chiefly on account of the slow rate at which they travelled, and partly of the low fares and increased speed of the public coaches. To endeavour to remove the principal cause of this, the committee of the Union Canal, at the suggestion of Mr. Thomas Grahame of Glasgow, to whom they admitted they were under great obligation, joined in 1830 the committee of the Forth and Clyde Canal in instituting a set of experiments to ascertain at what rate of speed light passage boats could be tracked along the canals. The result of these experiments, although attended with considerable expense, was found to be very favourable; and the committee therefore ordered a light iron twin passage boat to be built, which was expected to be tracked at much less expense and faster than the existing passage boats.

The following extract from the *Edinburgh Advertiser* gives an idea of the great importance that was attached to the result of these experiments, and the extravagant estimate that was made of the effects that would flow from them:—

"We regard the experiments described below as extremely important. If the result is correctly stated and if no counteracting disadvantage has escaped notice, we think these experiments may

be said to have added a million sterling to the value of canal property in Great Britain, since they must at no distant period add fifty or a hundred thousand pounds to the annual dividends. Nothing can be more paradoxical or startling in appearance than this result; and yet our knowledge of the many unexpected truths in mechanical science which experiment has brought to light will not permit us to reject it as incredible. It is this:—*that the surge generated in a canal by the motion of a boat, and which is so destructive to its banks in moderately rapid motion (such as four or five miles an hour), ceases altogether when a high velocity is employed.* It is true the vessels were of a particular construction but this is immaterial.

“A boat sixty feet long and five feet wide is capable of being extremely serviceable, both for conveyance of goods and passengers; and if such a boat can be safely and conveniently dragged at the rate of nine or ten miles an hour upon our canals, passengers by this species of conveyance will be upon a level, as to speed, with those who travel per mail. The great recommendations of canal carriage at present are, its cheapness, and the liberty of locomotion which the passengers enjoy. Its leading disadvantage is its slowness, and this is felt now more and more, when our stage coaches are touching a speed of ten miles an hour, which will soon be doubled on our railways

“*The quicker the boat went, the more entire was the disappearance of all wave or surge, except where the water escaped in the centre of the canal and met in two very noisy and rapid currents from each side of the boat at the rudder. This noise and rush of water was so great behind as to induce persons on board to look round expecting to see a great wave or surge on the banks of the canal, but on the banks there was hardly a ripple. The two rapid noisy currents seemed to be completely spent and exhausted by the shock of their concurrence behind the boat. Here, therefore, there was no room to doubt of the correctness of the reports of the Forth and Clyde Canal experiments. It was not merely to be said, that the greater the speed the less surge or wave, but it was demonstrated that, at a high rate of speed, surge and wave were done away with altogether.*” The Union Canal proprietors seemed to have little hesitation in concluding that by the aid of this discovery they would defy the railways, and, as the following extract from their report says, enable them to “keep pace with all the accommodations of travelling.”—

“It is now demonstrated beyond a doubt, that it is perfectly practicable to move along canals at a rate much more rapid than formerly anticipated. Boats are now building of thin plate iron, which, it is expected, will perform the voyage between Edinburgh and Glasgow in a comparatively

short period ; and, in a short time a steamboat will be started which the Forth and Clyde Canal Committee, for whom she is building, expect will perform the voyage with still greater velocity. It is an important discovery that has lately been made, that the surge generated in a canal by a light boat at a moderately rapid motion, such as four miles an hour, ceases altogether when a high velocity is employed. From this remarkable fact, it is not unnatural to conclude, that canal navigation may still be in its infancy, and that there is no saying what improvements may yet be made upon it. These may certainly be expected to keep pace with the improvements on roads, and all the accommodations of travelling."

The increased speed was also tried successfully on other canals in Scotland. Thus we learn that "the ordinary speed for the conveyance of passengers on the Ardrossan Canal was, for nearly two years prior to 1831, from nine to ten miles an hour ; and Mr. Grahame, C.E., reported, although there were fourteen journeys along the canal per day at that rapid speed, its banks had sustained no injury." The following information is given a few years later as to the speed attained and the fares charged on the same canal :—"The distance from Glasgow to Paisley is $7\frac{3}{4}$ miles by canal, and the distance from Glasgow to Johnstone is more than 11 miles. The canal boats run the distance between Glasgow and

Paisley in fifty minutes, and take in and put out a good many passengers at different places on the way, and the distance from Paisley to Johnstone is run over in a time proportionably short. The cabin-fare is 9d. and the steerage fare is 6d. from Glasgow to Paisley. When passengers go from Glasgow to Johnstone they are charged 1s. in the cabin and 9d. in the steerage. The best speed for the Paisley canal boats is greater than nine miles an hour."

Perhaps, before dismissing this subject, it may be interesting to show that this matter of using steam upon canals is still a branch of study and invention in America, where there is an extensive system of canals. According to the following description, taken from an American magazine of 1876, all that can be hoped for in the way of conserving power in the boat and saving the banks of the canal would seem to have been attained :—

"The most recent pattern of steam canal boat or canal tow-boat that has been launched, is an iron boat having a square section amidship—that is, she has a flat bottom, with square upright sides. Both bow and stern are of the same form, and rise longitudinally with square corners. At the stern the side plating hangs down at each side to the level of the bottom, thus inclosing the screws and rudder in a hood. There are four screws placed in pairs on each side of the rudder, and each pair driven by a single engine. Each

shaft has a slight pitch downward, and is connected with its engine by geared wheels. The chief point of interest in this boat is the iron skin or guard on each side of the propellers. All the water displaced below rises at the stern against the propellers, and there is no suction or inflowing of the water at the sides, and there is little disturbance of the surface. The usual centre keel at the stern is omitted. The boat is said to display good towing power, with no injury to the banks of the canal by washing."

The application of steam power to haulage on canals was, by the invention of the submerged screw propeller, thought to have rendered it a mere question of comparative expense, as all the detriment either to banks or bottom from the propelling machinery was obviated. This was the opinion thirty years ago, but the above extract shows that every perfection has not been attained even in our own day.

AMENITIES OF CANAL TRAVELLING.

"Travelling in this way," says Alexandre Dumas, "has one advantage, that the movement being almost imperceptible, you can write or draw as you proceed. Certainly the society you meet with there is but little disposed to meditation, but on this occasion we were almost alone, so that, what with writing and drawing, we reached St. Gilles sooner than we expected." What M. Dumas

says of the canal Beaucaire is true of canals generally, though his efforts to see the country, rendered unsuccessful because the canal is enclosed, at some portions of its route at least, between two embankments of twelve to fifteen feet high, may be rewarded better on some canals than by a sight of the two horses which drew the passage boat, and the man who drove them—the prospect which set the great French novelist to discover the capabilities of a canal boat for writing and drawing.

M. Dumas refers to the society met with in a canal boat as generally little inclined to meditation, and the remark is a just one. Although in some of the extracts already given allusion is made to the privilege of moving about from place to place on the boat, enjoyed by the passengers, our own recollection on the subject rather points to a standing rule of the boats, that the passengers should sit perfectly still, in case of destroying the equilibrium of the vessel. If this were so, and people had not yet arrived at the age of penny papers and "railway literature," conversation naturally formed one of the chief amusements of the journey. Not only was the smoothness of the journey—barring an occasional bump on the side of some narrow aqueduct—very favourable to writing or drawing, but the quietness of the progress, seldom broken by more than the rush of the water against the side of the barge,

rendered conversation easy and agreeable. The enjoyment might be interrupted at times by the meeting of two barges, when the drag-rope of one had to be passed beneath the other, but on the



whole a journey by canal might be made one of placid and gentle enjoyment :—

Even in its very motion there was rest !

Charles Dickens, who seems to have left no method of travelling without illustration in his works, has a few references to the dreamy

progress of a barge upon a canal. In the *Old Curiosity Shop*, in describing "Little Nell's escape, with her grandfather, from the scene of the latter's temptation, he furnishes the following nicely-drawn picture :—

"The boat came close to the bank again, and before she had had any more time for consideration, she and her grandfather were on board, and glided smoothly down the canal.

"The sun shone pleasantly on the bright water, which was sometimes shaded by trees and sometimes open to a wide extent of country, intersected by running streams, and rich with wooded hills, cultivated land, and sheltered farms. Now and then a village, with its modest spire, thatched roofs, and gable ends, would peep out from among the trees; and more than once a distant town, with great church towers looming through its smoke, and high factories or workshops rising above the mass of houses, would come in view, and, by the length of time it lingered in the distance, show them how slowly they travelled. Their way lay, for the most part, through the low grounds and open plains; and except these distant places and occasionally some men working in the fields, or lounging on the bridges under which they passed, to see them creep along, nothing encroached on their monotonous and secluded track."

The canal station-house was sometimes in the centre of a town, while sometimes the exigencies of

the work took it away to a distance from the habitations of men. It is at such a place as the latter that an impromptu by Professor Blackie is preserved in the visitors' book at the inn, in which

Whoso would lodge in peace and quiet,
Far from the town's dust, din, and riot,

is invited to take up his abode
for a time

At ———, where the great canal
Unbars her gates at seaman's call.

The following is Dickens's picture of such a canal-station as is to be found inside a town :—

"They had for some time been gradually approaching the place for which they were bound. The water had become thicker and dirtier; other barges coming from it, passed them frequently; the paths of coal ash, and huts of staring brick, marked the vicinity of some great manufacturing town; while scattered streets and houses, and smoke from distant furnaces, indicated that they were already in the outskirts. Now the clustered roofs and piles of buildings, trembling with the working of the engines, and dimly resounding with their shrieks and throbbings; the tall chimneys vomiting forth a black vapour, which hung in a dense ill-favoured cloud above the housetops, and filled the air with gloom; the clank of hammers beating upon iron, the roar of busy streets and noisy crowds, gradually augmenting until all the various sounds blended into one, and none was distinguishable for itself, announced the termination of the

journey. The boat floated into the wharf to which it belonged."

A very different picture, pleasanter in every way, is that which Alexander Smith, in *Alfred Haggart's Household*, has left of a canal-station at "Greysley," the barely concealed name of a station on the Johnston Canal:—

"When they drew near the station-house, Jack in huge delight spied at some distance beyond, and coming towards it, the long white passage-boat, and the black caps and scarlet jackets of the outriders. At the station-house the boat stopped to allow passengers to get out, and to take in others. . . . The station-house, situated on the bank of the canal, was a small white inn, which, if one might judge from its somewhat dilapidated appearance, did not drive a roaring trade. Behind were one or two outhouses, and on the same line with itself was a large shed in which luggage for the passage-boat was stored. The whole place was sleepy enough usually, and only when the boat appeared did it wake up to some semblance of life. Half a dozen intending passengers came out of the inn with their parcels and stood upon the little wharf. Up trotted Smiler and Paddy from Cork (horses employed on the canal) with their riders, who seemed to look down haughtily, as befitting their dignity. The drag-rope was immediately unloosened, and the long boat with its white awning came alongside the wooden wharf with a bump.

Parcels were tossed in, parcels were tossed out; passengers stepped in carefully and disappeared under the awning; passengers emerged from the awning and stepped out carefully upon the wharf."

In an earlier page reference is made to an advertisement of 1783, in which the endeavour—no very high one—was to be made to render the canal passenger service "as secure and certain as the stage waggon." In the matter of punctuality the canal boats enjoyed a not undeserved reputation, as, barring accidents or frost, there was little to obstruct the progress of the boats. Punctuality is, indeed, the only quality for which we have observed the canals of Ireland were made the subjects of commendation. In Wakefield's *Account of Ireland*, in 1812, we read the following:—

"The boats on the Grand Canal and Royal Canal are conducted with a punctuality and despatch highly creditable to the companies to whom they belong. I travelled by these water conveyances, to ascertain how they were conducted, and found that I arrived at the place of destination nearly within a minute of the stated time. Good hotels, with every accommodation for travellers, have been erected by the companies at the places where the boats are accustomed to stop."

One drawback that was early noticed with regard to English canals was that there was no uniformity of size, so that boats frequently could not pass from one

to another, and thus one of the chief probable advantages of canal travelling, namely through conveyance, was lost to the traveller, who suffered all that inconvenience which "break of gauge" entailed in the railway system at a later date. Foreign engineers have not been slow to notice this defect, and, much as it was to be regretted,—and is still, though not by the "human parcel,"—persons who considered the subject have consoled themselves with the knowledge that, thanks to our uncontrolled liberty, the system of inland navigation grew apace, making the condition of England, in this respect, superior to any other country, scarcely any place of importance in the kingdom being more than ten miles distant from water carriage. In one place we read of an effort to cure this break of canal gauge as directly resulting from the threatened opposition of the railways. The arrangement was not, at first, so successful as it deserved.

The directors of the Union Canal, in 1830, reported that they had entered into an arrangement with the Forth and Clyde Canal Company for the purpose of running the night passage boat direct between Edinburgh and Glasgow, which would have obviated one great cause of complaint made against these boats, viz. the passengers being obliged to shift themselves and their luggage from one boat to the other, and to walk, under all the inclemencies of a winter night, between the two canals,—from which it was con-

fidently anticipated an increase of revenue would have taken place. This arrangement, however, was soon interrupted by the canal being frozen up, and had not, at the time of the report, been renewed.

CANAL SCENERY.

The proprietors of the Union Canal were not slow to perceive that, as regards picturesqueness and fine scenery, their route could defy the proposed route of the railway. There will always be many, the committee say, who will "prefer travelling by a route through richly diversified scenery to one well known to be so very bleak and barren as almost to beggar description." The elevated position of a canal in many of its parts made a journey along it the means of seeing the country as a slow-moving panorama, different from the view of the scene from the coach road or from the railway, though not certainly surpassing some aspects of the country presented by the other modes of conveyance. That the scenery of the Union Canal was "diversified" in a way different from the meaning of the committee whose report is quoted above, may be seen from the following curious note, copied from the *Edinburgh Evening Courant* of 12th December 1822, the year the canal was opened :—

"Along the banks of the Union Canal certain edifices have been erected which strike the traveller with no little astonishment. These

are huts erected by Irish labourers upon some few vacant spots of ground belonging to the canal proprietors, and are pointed out to strangers in the passage boats as great curiosities. Each, of course, is more wretched than another, and presents a picture of squalid poverty which is new to people on this side the Channel. One of them, with the exception, perhaps, of a few sticks, is composed entirely of rotten straw; its dimensions would not suffice for a pigstye, and its form is that of a beehive, only it is more conical. The smoke which does not escape at the door penetrates through every part of the structure, which thus presents at all times the appearance of a hayrick on fire. A Hottentot kraal, in comparison with it, is a palace. In the midst of so much misery the children appear healthy and frolicsome, and the men and women contented and happy."

Generally speaking, the canal, by its bridges, its clothed banks, or its glittering waters, added new features to the scenery, so that we may quite agree with a foreign visitor named Simonds, who in his *Residence in Great Britain*, dated 1810, tells us that the canals of England "wind round hills, following levels, like natural streams, and are not at all offensive, in a picturesque light, except when they happen sometimes to travel side by side with a real river."

Canals present features of attraction in another way, namely to the pedestrian, and the pleasures

of a walk along the elevated banks of a canal have been described in the following sprightly fashion in *Blackwood's Magazine* for February 1876, by the author of *Bates' Tour*, personally conducted:—

"Of all the walks which a naturally indolent individual can take, that along the towing path of a canal is the most delightful. The total absence of those distortions of nature's original plan in the shape of upheaval or subsidence of the true surface, raved about by poets and women as 'hills' and 'dales;' the knowledge that every yard you walk is three feet of actual progress, and not one foot *forward* and two feet *up*; and the recollection that, should 'things' become too hard to be endured, one plunge (with your pockets full of stones) into the placid stream which flows—or rather, does not flow—beside you, will cure all mortal ailments,—all these considerations are calculated to soothe the troubled spirit." Some inveterate joker may suggest that at least one who thus took his *quietus* in a canal could not be held as *felo de se*. The idea of drowning brings us to the subject of the

DANGERS OF CANAL TRAVELLING.

These were not very many. One form of them is thus gravely propounded in the seventh edition of the *Encyclopædia Britannica*:—

"A small boat closely covered is by no means free from danger on a deep canal, for if by accident

or mismanagement it were allowed to sink, it would be very apt to confine the inmates under water till they were drowned, especially as those who become frantic would prevent the more sober from escaping." Whether such a catastrophe as is here proposed ever did take place, we have not found proved from actual record, but we have extracted from an Edinburgh newspaper the following description of a scene in which a popular actress of two generations ago ran a serious risk of drowning :—

"The packet from Lock No. 16 came into Port Hopetoun at ten on Wednesday night crowded with passengers. Although there are lamps at the landing place, its unfinished state renders it dangerous to persons unacquainted with the spot." The narrative proceeds to tell how first one gentleman and his trunk fell into the canal and was rescued, and another—an actor named Hilliard—also fell in and was rescued with no further damage than the loss of an umbrella. It then adds—"While his friends were advising him to hasten home a third splash was distinctly heard, accompanied with an outcry of 'A woman has fallen in! hand the boathook.' The general agitation increased, but the feelings of a husband and daughters were extreme on discovering that Mrs. Nicol having stepped aside in search of her umbrella, had gone head foremost into the basin. By the activity of the porters and boatmen, she was, however, soon rescued from

her perilous situation, having retained sufficient presence of mind to conclude that her clothes would support her until she seized the proffered hook. She walked home as fast as possible, and everything being done to prevent cold we are happy to state that this distinguished favourite of the public and deserving private character has not suffered any material injury." There was one danger in canal travelling from which the passenger was bound to protect himself by watchfulness—we refer to the extreme narrowness and lowness of the bridges on those canals where only towed barges were used. "Look out" was a command which a French visitor to this country too literally obeyed as the canal boat on which he was travelling was approaching a bridge. As he drew back his head, with an action more rapid than that of putting it out, he was heard to exclaim, "Dese people say 'look out' ven dey mean 'look in!'" The following is a jocular description of a wreck upon a canal, by the writer in *Blackwood's Magazine* quoted above :—

"The dangers of the sea are proverbial, but then they are to a certain extent discounted by the anticipations of those venturesome persons who 'go down' to it 'in ships;' but a shipwreck in the Caledonian Canal! who can imagine that scene of horror! The captain's firm yet despairing eye! the shrieks of the women and squalls of the children! the vain effort to man the boats! the crew

upon their knees! confusion! thunder! lightning! etc. etc. Suddenly, in the offing, rescue! Can it be? yes; a man with a cart horse! To hail him to heave to, to 'heave to' him a rope, is the work of but a moment; and, in less time than it takes to imagine the whole scene, the tow-rope tautens, the women cease to yell, the crew arise from their knees, the captain's eye regains its usual expression of idiotically looking out for squalls; and the good ship, rescued from the sunken soda-water bottle on which she had struck, once more stands on her course for Fort Augustus."

EXISTING PASSENGER BARGES.

The ordinary passenger barge is not altogether a thing of the past, to be reckoned with the *dodo* or the cave-bear, as the following description of an existing passenger service on the Forth and Clyde Canal, extracted from Gillespie's *Glasgow and the Clyde*, published in 1876, will show:—

"Those who remember when six passenger boats plied daily on the canal, with refreshments and a library on board to break the monotony of the weary journey from Glasgow to the east and *vice versa*—when horses with their red-coated and cocked-hat riders did the duty of steam—would now heave a sigh for the 'good old days,' on seeing what remains of the old ocean highway traffic between the two great Scotch cities. The boat which now

cultivates a portion of the route, though provided with steam-power, is but a shadow of the past. Its customers are of a different stamp; its business relations are of a petty description; and but for a few towns along the valley of the Kelvin, which are still badly provided with railway communication, its occupation would be gone. The Canal Company early realised their position as a passenger-carrying company; and as far back as twenty-four years ago, instead of pushing their opposition to any extremity with the old Edinburgh and Glasgow Railway Company, they leased their interest in that department to Messrs. A. & J. Taylor, who supplied the wants of various districts between Port-Dundas and Lock 16 with one boat manned by a couple of pairs of horses. Sixteen years ago, the Messrs. Taylor introduced steam-power, and the "screw" which was then launched still does duty on the canal. It is now owned by a genuine type of the old Scotchman, Mr. George Aitken, a late servant of the Canal Company; and though the tiny steamer is not a fortune-making concern, it has been found useful to many little villages, and has afforded an ordinary income to the proprietor. The vessel is 8 tons register or 12 tons gross, is worked by an engine of 12 horse-power, and carries 86 passengers—26 cabin and 60 steerage.

"Though sixteen years of age, the *Swifter*, as its patrons call it, is still good in hull and equipment

During the first five days of the week it plies between Castlecary and Port-Dundas ; and on Saturdays it goes as far as Lock 16. It is seen to best advantage on a summer Saturday afternoon ; and if one takes a cabin passage, which is not much dearer than a steerage one, he is within talking distance of the old skipper, who finds leisure at intervals to crack jokes and point out the beauties of the scenery to be seen along the route.

"The *Swifter* is the last link in the history of passenger traffic on the Forth and Clyde and Union Canals, a route at one time so serviceable ; and it is now feared that the Kelvin Valley Railway, at present in course of construction, will completely absorb the old system. In these times of precious hours, the more speedy means of conveyance is likely to gain the victory."





CHAPTER III.

Bid the broad arch the dangerous flood contain,
The mole, projected, break the roaring main,
Back to his bounds their subject sea command,
And roll obedient rivers through the land.
These honours Peace to happy Britain brings ;
These are imperial works, and worthy kings.

POPE'S *Moral Essays*, iv. 199-204.

SHIP CANALS—THE CALEDONIAN CANAL—THE FORTH AND CLYDE CANAL—CANALS IN HOLLAND—FRENCH SHIP CANALS—THE SUEZ CANAL.

SHIP CANALS.

WHILE inland canals have greatly decayed even as means for the conveyance of goods, and are almost though not yet wholly unknown as a means of passenger travel in our country and in our day, the ship canal—those waterways “affording a short and sheltered passage for sea-borne vessels,” as a recent writer very well describes them,—have of late years greatly increased in importance, the success of the Suez Canal, in a mercantile point of view, having not only confirmed the usefulness of previously existing structures, but given an impetus to the consideration of new works or enlargements of existing works of like nature.

Such canals are recognised as consisting of three distinct types, only one of which is however illustrated within our own country. The classes are, first, canals which traverse high-lying districts by

means of locks, of which the Caledonian Canal is probably the most remarkable illustration ; second, canals through countries so level that the entrances have to be defended by gates against the superior level of high water, of which instances exist in Holland ; and third, those works, of which the Suez Canal is the only existing example, where the course is open at both ends, and takes its water supply direct from the seas which it unites.

THE CALEDONIAN CANAL.

Although not the first of ship canals in Britain in respect to its date of completion, this is the greatest work of its kind, and deserves first notice. The first survey for this work was made by James Watt as early as 1773, the inquiry, as was also the case thirty years later when the work

was begun under Telford, being at the instance of the government of the day.* The object in view was to save vessels the long and dangerous voyage by Cape Wrath and the Pentland Firth, the distance from Mull to the north-eastern promontory of Aberdeenshire being reduced one half—or from 500 to 250 miles—by the use of the canal. Out of the 60 miles of which the canal consists, 37 miles are through natural lakes, and all but two miles of the remainder pursue the course of rivers, the line of the great Glen of Albyn, as it is called, being closely followed. From the harbour a little below Inverness to Loch Ness is a distance of seven miles, over which the canal runs nearly parallel with the river Ness, rising forty feet by means of six locks. Before entering the larger loch, the canal passes through a sort of *avante-porte* in Loch Dochfour, an arm or creek of the larger water cut off from it by a projecting bank of gravel. The effect of this singular bank is to act as a natural breakwater, relieving the weir of the river and the canal works of the enormous pressure of the waters of a lake twenty-four miles long, one mile and a half wide, of immense depth, and subject to sudden and severe storms of wind which agitate its surface. The bottom of Loch Ness is 70 fathoms deeper than any part of the Moray Firth, and 40 fathoms deeper than any part of the North Sea between Inverness and Jutland. In dredging

between Loch Ness and Dochfour, buried trunks of large trees were brought up, one specimen weighing three tons and another seven tons.

Between Loch Ness and Loch Oich are seven locks, bringing the height to 102 feet above neap-tide level at the eastern entrance. The latter loch is three and a half miles long, and the next cut, two miles long, carries the channel by means of two locks into Loch Lochy, a sheet of water about ten miles in length. The final cut of eight miles in length is partly on the level of Loch Lochy, and then descends by "Neptune's Staircase" to near the level of Loch Eil, where finally, two locks complete the work, and bring the vessel into western waters. So far as it is artificial, the channel is constructed with a width of 120 feet at the top, and 50 feet at the bottom. The design was that the canal should possess a standard depth of 20 feet; but Mr. David Stevenson states as the result of his inquiry into the condition of the canal in 1849—made at the request of the Admiralty—that the standard depth of the channel could not be regarded as more than 18 feet, giving access to vessels of 160 feet length, 38 feet beam, and 17 feet draught of water.

The canal presented great difficulties in an engineering point of view, and is regarded as a striking monument of the skill of Telford, who designed the work and superintended it to a successful completion. After eighteen years'

hard toil, the canal was opened in 1822, having at that time cost above £800,000. The entire cost has been considerably more than a million; and while as a great national undertaking it excites our admiration, as a commercial enterprise it has proved as unremunerative as most of the other canal properties in this country.

There is probably no artificial channel in the world so well known to travellers for pleasure as the Caledonian Canal. For many years it has been a favourite route for the tourists who visit Scotland annually, forming in its magnificent scenery, the interesting associations of the district, and the comfortable service of steamboats plying upon it, one of the most enjoyable journeys open to the pleasure-seeker. In this regard, the Caledonian Canal might almost be more properly described under a subsequent head in this book, for it is the steamer and not the canal boat that has given the voyage through Glen Albyn the attraction it presents to the traveller. As a commercial speculation it has been a total failure, and it is only valuable as a national undertaking that gave much employment to the people while in process of making—a circumstance which was specially adverted to in the newspapers of the time on its completion, unlike the views as to the Irish Canals quoted on an earlier page—and as having opened up in a valuable way, a district that could not have been so opened under a private speculation. In the year to 30th

April 1876, the total revenue of the Caledonian Canal was £6741 : 10 : 4. The expenditure that year was reported as “exceptionally heavy,” and amounted to £9307 : 13 : 2, or a deficit of £2566 : 2 : 10. In the previous year the revenue was £6070 : 2 : 8 and the expenditure £7064 : 11 : 7, being a deficiency of close upon £1000.

THE FORTH AND CLYDE CANAL.

This work, designed by Smeaton, with the assistance of Brindley, was, as stated in a previous chapter, the realisation of ideas thrown out at various times in the course of the seventeenth and eighteenth centuries. We read in the *Reminiscences* of Mr. Reid, of Glasgow, that “on the 10th of June 1768 the first spadeful of earth for the formation of the Forth and Clyde Canal was dug out. The navigation was filled with water on 3d September 1773, and to Stockingfield on 10th November 1775. On the 10th November 1777 the collateral cut to Hamilton Hill was finished, where a large basin was made for the reception of vessels and rafts of timber. On the 6th of July 1786 the operations commenced for extending the navigation from Stockingfield to the Clyde, which was completely finished and the canal opened from sea to sea on the 28th of July 1790.” From a notice in the *Glasgow Mercury* of September 1790, it appears that the sloop “Agnes,” 80 tons burthen, belonging to Port-Glasgow, and built at Leith

for the herring-fishing and coasting trade, was the first vessel that passed through the canal from sea to sea, this taking place on 31st August, while the sloop "Mary M'Ewan" reached Grangemouth from Greenock on 9th September, being the first vessel to pass from sea to sea in the other direction. From Mr. Reid we obtain an insight into the relative importance of this canal last century and in our day. He says, speaking of the year 1788—"At this time Mr. Gouldburn had erected 117 jetties on the Clyde between Glasgow and Greenock, and had deepened the channel of the river, so that vessels drawing seven feet of water could navigate up to the harbour at the Broomielaw, but the canal being eight feet deep, immediately on its being made open for traffic, became a more important port than the Broomielaw." In proof of this Mr. Reid quotes two long lists of arrivals of vessels at the canal basin published in the *Glasgow Mercury* in February 1778, while in the same time no notice of vessels arriving at the Broomielaw is given in the public prints. This was before the completion of the work from sea to sea, but the importance the canal held for a time was gradually lessened as the Clyde was gradually made deeper and deeper, till now any attempt even to suggest a comparison of the bustle of the Broomielaw and the splendid ocean-going steam-vessels of the first class that arrive and depart there, with the miserable and decrepit trade of Port-Hamilton and the canal, would

only excite a smile. The Crinan Canal, joining Loch Gilp with the Sound of Jura, and thus saving the journey round the Mull of Cantyre, is properly a ship canal, but its insignificant size and shallow channel deprive it of any pretensions to more than local importance. Though less noteworthy in nearly every way than the Forth and Clyde Canal, the cut at Crinan merits notice here as one of the links in the chain of tourist routes organised by canal and sea round the west of Scotland.

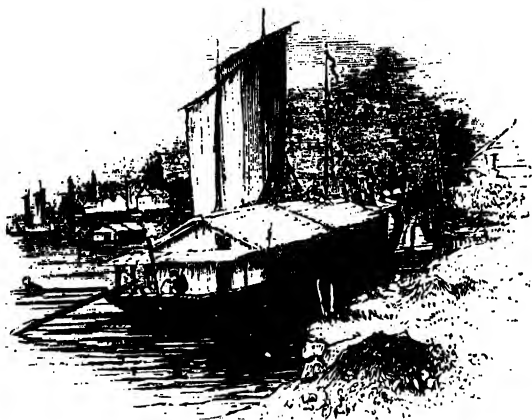
SHIP CANALS IN HOLLAND.

If Holland, in the words of Andrew Marvell, "scarce deserves the name of land," it certainly deserves notice for the energy and determination with which it has struggled to make the best of its watery condition. Butler's description of the country is irresistibly comic and complete, in light of the fact, so different from the condition of the canals of the first category with which we have been dealing, that "these vessels are locked down from the sea into the canal," and that it is from the weight of the waves pressing inwards, and not that of the inland lake pressing outwards, as at Loch Dochfour, that the engineer has to preserve his work :—

A country that draws fifty feet of water
In which men live as in the hold of
Nature,
And when the sea does in upon them
break
And drowns a province, does but spring
a leak !

The *Noord Hollandsche Kanaal*, designed by Blanken and completed in 1825, places the city of Amsterdam in direct communication with the German Ocean by a canal of fifty miles in length, and by its depth it enables vessels of about 1000 tons burthen to reach the Dutch capital without encountering the shoals and dangers of the Zuyder Zee. The flood-gates at the entrance are the broadest in Hol-

land, being sixty-five feet in width, and the fortifications and enormous dykes of the Helder protect this work from the action of the sea and from hostile attack. The Helder is almost the only place on the Dutch coast where vessels can come close in shore, as the force of the tide running between the island of Texel and the north point of the mainland keeps the channel clear. This in some



measure accounts for the choice of this point for the embouchure of the great ship canal, for a glance at the map shows that it pursues a long and devious course through the lakes and polders of Holland, and that the sea could be reached by a much shorter route from Amsterdam. Despite the great cost of this work and the success which has attended it, the length of the canal, and the general increase in size of vessels engaged in

commerce, both pointed to some new access to the German Ocean being desirable. Forty years after the completion of M. Blanken's great work, a company was formed for the construction of the North Sea Canal. This fine undertaking is $16\frac{1}{2}$ miles long only, giving a gain of about 30 miles in the voyage to Amsterdam as compared with the earlier work. By its greater depth, too, it opens the way for larger vessels, and thus

secures to Amsterdam its business as a flourishing seaport. On the sea face of this canal two piers nearly a mile long have been completed, the mode of construction being by concrete blocks. The area enclosed by those piers, extending to about 260 acres, is intended as a harbour in which vessels will find shelter. For drainage purposes, the promoters of the canal were compelled to keep the water level in the canal always 19 inches below mean high-water level, and for this, and other purposes, pumps of enormous power have been provided. In its earlier stage, the canal passes through the broad belt of sandy dunes which form the sea boundary of Holland at this place, and here a surface width of 197 feet has been provided, the width at bottom being about 90 feet. About three quarters of a mile from the sea harbour the entrance-locks are placed, and they present a striking feature in the fact that they provide three openings of different dimensions. The gates are respectively 30, 40, and 60 feet wide, with length to correspond—the greatest lock giving a length of 390 feet—the advantage of this arrangement being that the gate opened can be proportioned to the length of the vessel seeking entrance or exit, and the pressure upon the gates is distributed. Another feature of the canal is one which may in a sense be said to be borrowed from the Chinese, namely the embanking of canal channels through the centre of the Wyker Meer and

the Lake Y or IJ. Including branches, the banks constructed to form those channels extend to 38½ miles, and it is proposed that after the canal is completed the land forming the bottom of the two lakes should be reclaimed. The banks are placed about 150 yards apart, have each a surface breadth of 84 feet, and rise about 20 feet above the mean tide level. The banks are formed of the sand dug in cutting the canal elsewhere, the face coated with clay and protected with fascines, and the whole being subsequently protected with stone after the manner of the Dutch dykes. The estimated cost of this useful undertaking was 2¼ millions sterling, and the reclaimed land to be gained is expected to reach a total of 12,000 acres. This canal was designed by Sir John Hawkshaw.

FRENCH SHIP CANALS.

Before describing the great work with which the name of a distinguished French engineer is associated, some proposals to extend and enlarge the Languedoc Canal so as to fit it for larger vessels, may be noticed. When it is remembered that this canal, through its various connections, furnishes a short cut of 148 miles from the English Channel to the Mediterranean—saving about 2000 miles of a voyage through the Straits of Gibraltar and across the dreaded Bay of Biscay—the importance of these proposals from a traveller's point of view will be

admitted. If a steamer of ordinary size could take such a short road to the Mediterranean, and, passing through the Suez Canal, continue its journey to India, the "Overland Route" would be practically abolished, and it would become an "Oversea route." It would not be perhaps quite so quick in point of time as the route *via* Brindisi, but as it would save three or four transshipments, and at the same time offer an escape from the "horrors of the middle passage" between Southampton and Gibraltar, the route would doubtless become a favourite one. The following description gives a fair idea of the purposes and prospects of the proposed

NEW FRENCH CANAL.

"The projected Grand Canal is intended to be 300 feet wide at the bottom, 30 feet deep throughout, to flow through Bordeaux, Agen, Toulouse, Carcassonne, Narbonne, and not Cotte, but, either La Nouvelle or some point still nearer to Narbonne, which is the shorter course by about 40 miles. This canal will enable English ships bound for the Mediterranean or the East to save from 800 to 900 miles—in fact, it will complete the Suez Canal, and be, with regard to England, the missing link in the great water-way to India. Even when cut between the two nearest practical points, the Grand Canal must still be a very costly undertaking; but the

capital and engineering skill are in Paris and London waiting for employment. All that is needed is to show the public that a good return may be expected. The French Government will readily enough grant a concession if no guarantee or subvention is asked for. Now, the Grand Canal du Midi will free for ever the South of France from all inundations; it will receive above twelve millions of tons of shipping a year; it will enable the owners to dispose of an average of 21,000,000,000 cubic yards of water a year for irrigation or motive power. If the whole of this water were used for the wants of industry alone, it would give in the valley of the Garonne alone four times the power required for the cotton mills of the whole world. Very slight tariffs would procure from these two sources an income which would justify the outlay of a far larger sum than the projected canal is likely to cost."

A less ambitious project is to connect the two seas by a canal only a little larger than the existing works. The merits of the latter proposal are discussed in an interesting way in the following remarks of a well-informed newspaper writer:—

"Although droughts do not cause the evils which they produce in Asia, they are still frequent and disastrous, especially in the south of France. There, accordingly, irrigation plans are under constant discussion. At the same time, the destructive floods which

have carried ruin over extensive and flourishing districts during the past twelve months have served as effectual reminders of the need that exists for regulating and controlling the mountain torrents and great rivers, which, if rightly managed, are a source of wealth and prosperity. Lastly, the high charges of the railways have made it a matter of pressing urgency to trade to discover some cheaper mode of conveying bulky goods from one part of the country to another. The six great companies amongst which France is partitioned out, enjoy from the Government a monopoly of the railway traffic. At all times they have shown themselves little regardful of the interests of industry, and since the war has compelled an increase of taxation they have been especially exacting in their charges and niggardly in the accommodation they have given in return. For these reasons the attention of the commercial public has been turned to canals, and engineers and business men have suggested and discussed during the last few years a great number of canal schemes. One of these proposes to join Bordeaux, in the Bay of Biscay, with Cette, in the Gulf of Lyons. The object is to shorten the passage from Northern Europe and the United States to the Mediterranean. It is calculated that the voyage would be reduced by three or four days, and that, tempted by such a saving of time, all vessels bound for Suez would pass through the proposed canal.

This project, however, is yet in the mere stage of incubation; we need, therefore, devote no more time to it. But the second canal, from Havre to Marseilles, seems really likely to be undertaken.

“So long ago as the year 1871 a commission was appointed by the National Assembly to report upon the best means of improving the navigation of the Seine. Practically, vessels can go up that river no higher than Rouen, and the cost of transshipment, it is said, nearly trebles the expense of conveying goods to Paris. But, in the meantime, while Paris was inquiring how it could transform itself into a seaport, Lyons was busy with a similar project. But it was suggested—Why not at once connect Havre and Marseilles? In this way the objects which both Paris and Lyons have in view would be attained, and the expense would not be very largely augmented. In fact if the deepening of the Seine and the Rhone is once taken in hand it would be a trifle to continue the work above Paris—up the Yonne on the one side, and down the Saône on the other. It would then be necessary only to widen and deepen the old Canal de Bourgogne, which already connects the Yonne and the Saône. The suggestion was advocated by able and skilful engineers, was discussed in the press, and after a while was taken up by the Chambers of Commerce and the Chambers of Agriculture. At the beginning of the year 1876 the Chamber of

Commerce of Paris sent out a circular to the Chambers of Commerce of the towns on the route of the proposed canal, in which the opinion of these bodies was asked as to the best means of executing the project. Delegates from the several Chambers had interviews with the Minister of Public Works, the Minister of Commerce, the Minister of Finance, and M. Gambetta, as chairman of the Budget Committee. By each and all they were received in the most favourable manner. The great importance of the proposed canal, the advantages it would confer upon the commerce of France, external as well as internal, and its practicability, were all conceded. There remained, therefore, only the question of cost; and as to this, also, the greatest eagerness was expressed to meet the wishes of the great cities which have taken the matter in hand. There seems little room for doubt, then, that the canal will be constructed. Under any Government an enterprise advocated by Paris and Lyons, Marseilles and Havre, Rouen and St. Etienne, Dijon, Avignon, Nismes, and Vienne, could hardly fail of success.

"According to the estimates of competent engineers, an outlay of £2,600,000 would execute all the works necessary to enable a vessel of 300 tons burden to pass from the Channel across France to the Mediterranean. Of this sum the works on the Seine and Yonne would require £600,000, those on the Rhone and Saône

£1,600,000, and those on the Canal de Bourgogne £400,000. This estimate, it will be seen, does not contemplate making Paris and Lyons seaports, much less constructing a maritime canal across France which would allow sea-going ships to avoid the passage down Channel, through the Bay of Biscay, and round Gibraltar. Vessels, as now, would have to unload at Havre, and a peculiar kind of boat would have to be constructed for the canal. But the advantages that would accrue to French trade are manifest and unquestionable, and the return even in tolls would be certain. On the other hand, the cost of a maritime canal would be enormous, its practicability doubtful, and its profitableness more than uncertain. It seems to be settled, therefore, that the less ambitious and more useful scheme will be undertaken. The estimate is that it would be completed in six years. The question remains, By whom is it to be executed?

"When an English company makes a railway or canal, or builds a bridge, it obtains the whole property in its construction, though sometimes subject to the right of the State to buy up the property. But the French proposal is that, as in the case of the Suez Canal, the concession to the company should cease at the end of a given number of years, but that a sinking fund should be established to pay back the capital sunk. Which of the three plans will be preferred is as yet uncertain.

THE SUEZ CANAL.

"Egypt has been in all ages the land of wonders," says Mr. Swayne in his *Herodotus*, (*Ancient Classics for English Readers*) "from the time when its 'magicians' found their enchantments fail before the mightier Power which was with Moses, to that when Napoleon told his soldiers that from the top of the Pyramids four thousand years looked down on their struggle with the Mamelukes,—and to our own day, when a French engineer repeats the feat of the old native kings and the Greek Ptolemies, in marrying by a canal the Red Sea to the Mediterranean; an achievement which will make the name of Lesseps immortal if the canal can only be kept clear of sand." We have in this sentence concentrated what a few years ago—Mr. Swayne wrote in 1870—was the prevailing idea in Britain as regards the Suez Canal. It was admittedly a big thing, and at that time, though British statesmanship and British science in the persons of Lord Palmerston and Robert Stephenson had prognosticated otherwise, the making of the canal was so far an accomplished fact. Nobody in Britain, for a long time, believed in the possibility of the canal proving successful. One only of our leading journalists—the late Alexander Russel of the *Scotsman*—had spoken hopefully of the affair, and the interesting building in *l'Exposition Universelle* of 1867, in

which the maps and models of the Suez Canal were exhibited, was probably a part of the collection which most British visitors passed by with a contemptuous remark. As a reward for his advocacy of the scheme, Mr. Russel received an invitation from the Khedive to be present at the opening ceremony in 1869, and his letters descriptive of the event present one of the most readable and complete of the narratives published at the time. The concluding words of his first letter have a curious interest now, when, through the action of our Government, the once despised work has become so largely the property of this country. "In a year or two," says Mr. Russel, "either the French shareholders will be poorer, or the British prophets will be wiser, men." The following sketch of the origin of the new scheme is extracted from Mr. Russel's letters:—

"Excepting for the purposes of reminding us that there is nothing entirely new under the sun, of increasing the wonder and admiration with which we are bound to regard the ancient people and dynasties of Egypt, and of supplying a contrast between ancient and modern means and appliances in the department of mechanics, there is little use in referring to that canal which, almost before the dawn of history, accomplished, on a scale sufficient for the wants of the time, what has now been accomplished again. There is adequate evidence that, about 600

years before Christianity came into the world, the Egyptians had constructed a water communication between the Mediterranean and the Red Sea, sufficient to allow ships probably of the largest size then known to pass through from Europe to India. It is true that this was not affected by an artificial canal throughout the whole distance, but by using the Nile to the utmost point available; but something of the same kind may be said of the great modern Canal, which, for the greater part of its course, takes its route through natural lakes. The construction of this work occupied a hundred years. The greater work of M. Lesseps has been accomplished in ten years. There are two causes for wonder here. Wonderful is the difference between the mechanical means at the command of the ancients and the moderns respectively, enabling a French engineer to accomplish a work four times greater in one-tenth of the time compared with the utmost efforts of the Pharaohs and all their hosts. But more wonderful still is the thought that, thousands of years before steam or almost any other of our great mechanical agencies had existence, such a work as the ancient canal between the Nile and the Red Sea could have been accomplished or even conceived. There is another reflection suggested by the history of this canal, which received too little weight during the controversies raised by the proposals in our own day, now

realised, and which ought to go far towards allaying the chief fears as to the future. The ancient canal was in use for many centuries, and is supposed to have been destroyed in the end only by barbaric violence. It seems indeed also to be true that, several times before its obstruction or abandonment, it was sanded up; but that seems to have arisen chiefly from sloth, carelessness, or anarchy, and whenever there was internal tranquillity, with moderately vigorous rulers, little difficulty appears to have been experienced in restoring it to use. If the ancients, with their imperfect knowledge and comparatively contemptible means, could thus keep their canal from being permanently filled up by the drifting sands, can there be imminent danger from that and similar quarters to a work in charge of those possessing both experience and power so far transcending? It is quite possible, however, to overrate the amount of safety, by taking false or insufficient data. Thus, too much is made of the falsification of the predictions about the railway through the same region being sanded over: people are apt to forget that, while the sand drifted on a railway has a chance or a certainty of being drifted away again, every grain of sand drifted upon the surface of a canal must of necessity sink and remain. The sand, we have a misgiving, will yet prove the chief danger of the Suez Canal, though not so

much in the shape of filling up by drift as by the gradual falling in of the embankments caused by the commotion or "wash" inseparable from navigation between strait limits, which it has not been found practicable to do more than partially face with stone.

"Before the beginning of the century, the idea of connecting the two seas by a canal navigable for sea-going vessels had engaged the attention of several French engineers, all, or almost all, of whom had been set at work by General Buonaparte, when he was in military possession of Egypt. At that period, the idea was abandoned, partly through the French being dispossessed in Egypt, partly through a gross engineering blunder showing the difference of level between the two seas to be upwards of 30 feet, whereas, as subsequent inquiries, especially one by a mixed British, French, and Austrian Commission in 1847, showed, it is not so much as 3 inches. Nearly forty years ago, M. de Lesseps, then apparently French Consul at Cairo, got his mind filled with the idea at which he has laboured ever since, and has now splendidly realised. A radical difference between M. de Lesseps' plan and that of his predecessors, ancient and modern, was, that he sought no aid from the Nile, but proposed to proceed by the nearest and of course most direct practicable line between the two most closely approaching parts of the two seas. For the history of the time between the

conception and the actual commencement of the work, we draw on a pamphlet by the Chevalier de Stoers, Bavarian Consul at Liverpool, who knows much about the whole matter, and says it with the utmost possible clearness and brevity :—

"In 1847, a man of incontestable talent, Le Père Enfantin, was greatly impressed with the project, and inspired some of his friends with his own enthusiasm ; and a commission of eminent engineers, including the English engineer Stephenson, the Austrian engineer De Negrelli, the French engineer Paulin Talabot, and M. Bourdaloue, an experimental operator, assembled, and proved, by levels taken with the most scrupulous care, that the difference between the levels of the two seas was not more than a few inches. These experiments were tested in 1853, by order of the Viceroy, by Linant Bey, a French engineer, and his operations confirmed them.

"These results showed that a direct canal between the two seas was perfectly feasible. M. P. Talabot, without including the creation of ports of access at the extremities, projected a canal to be alimented by the waters of the Nile, the execution of which would have been a matter of chance at certain points, and, at the same time, probably more costly than the excavation of a direct maritime canal. Moreover, at the low-water season of the Nile, it would have been impossible to retain sufficient water to ensure a continued navigation by this route. It is not necessary to refer to it further, except to remark that the researches made for it have also assisted in the solution of the question.

"In 1854, Mohamed Saïd Pacha, the son of Mehemet Ali, ascended the throne, and at once sent for M. de Lesseps, who had then, for some five years, retired from his office, and had spent that time in maturing his project for a direct canalisation of the Isthmus.

M. de Lesseps, on receipt of the Viceroy's communication, left at once for Egypt, and had no trouble in convincing Saïd Pacha of the greatness and importance of the undertaking. On the 30th November 1854, the first act of a commission, signed at Cairo, charged M. de Lesseps to constitute and direct a company, named 'The Universal Maritime Suez Canal Company,' for the excavation, and working of the canal for ninety-nine years from the date of the junction of the two seas. The necessary land for the foundation of the ports, the formation of the encampments, workshops, etc., and for the canal itself, was all conceded at the same time and for the same period.

"In April 1855 M. de Lesseps handed to the Viceroy the reports of the engineers Linant Bey and Mougel Bey, which constituted the first draft of the projected scheme; and an international commission, composed of eminent men representing France, England, Austria, Spain, Italy, Holland, and Prussia, assembled in Paris, and proceeded to Egypt to examine and compare this first draft of the scheme on the spot.

"The report of this commission, dated in 1856, is an admirable work. After having explored the whole country, the commission decided in favour of the creation of a canal between the two seas—a canal without sluices, and without other works of art than the ports of access. The commission, moreover, declared the project to be feasible, at an expenditure of 200 millions of francs, or eight millions sterling; and the probable cost was well considered in all its details.

"In 1858, after two years of conferences and preliminary steps of all kinds, M. de Lesseps opened a subscription to furnish the necessary funds. Notwithstanding the fears of an impending war, the greater part of the capital required was subscribed in a few days. There were great numbers of subscribers in most of the nations of Europe, but more particularly in France, which counts more than 20,000 shareholders. The Viceroy decided to take for Egypt the balance of the subscription, and the

management was speedily in a position to proceed with the execution of the work."

"The year 1860 was nearly closed before the preparations were sufficiently advanced to enable a commencement to be made by the workmen. These soon amounted to about 30,000—a number several times greater than the whole ordinary population of the Isthmus to be intersected. For some time, 25,000 labourers were supplied by the Viceroy, according to the original stipulation; and there is unfortunately sufficient reason to classify that aid as 'forced labour'—labour which would not have been rendered voluntarily, and which, though paid, was not paid its value. After a time, the Viceroy, probably somewhat in deference to the public opinion of Europe, and especially of England, but also in jealousy of the influence which the Company was acquiring over the natives, resiled from his engagement as to the supply of labour; and, on the award of the Emperor of the French, paid about £3,000,000 in lieu of fulfilment. The providing for the necessary hosts of workmen was one of the most arduous and wonderful parts of the undertaking. Not only had whole towns to be built in the desert, but works had to be executed on a national scale for supplying those towns with the most absolute necessities of existence. Thus, water could only be got by the construction of a fresh-water canal, 94 miles in length,

which taps the Nile about 50 miles from its mouth, runs eastward to Ismailia about the middle of the Grand Canal, and thence southwards to near Suez, the supply to the northward of Ismailia being conveyed in pipes. From the Nile to Ismailia and southwards, this 'sweet-water Canal' has already been used for the passage of small vessels. In short, it was necessary to make two canals, of almost equal length—one for the traffic of the world, the second merely to supply water for domestic uses to the workmen employed in the construction of the first. That single fact, better than any detailed narrative, should convey a true idea of the enormous difficulties of executing such a work in such a region.

"The Suez Canal is nearly 100 miles in length. It runs from Port-Saïd, on the Mediterranean, about 150 miles east of Alexandria, in a direction at first due south, then tending slightly eastwards, to Suez on the Red Sea. Great cost and difficulty arose at Port-Saïd, where it has been necessary to erect two piers or breakwaters, one of two miles, the other of one and a half miles in length. As illustrating the difficulties encountered at this point, look at the facts that the very ground on which the new town stands was sea and had to be made land, and that the stones had to be artificially manufactured by compounding lime and sand, the lime having to be brought from Europe—the sand locally superabundant. One

of the great dangers of the Canal—the silting up of the port of outlet by the Mediterranean sand—has already begun to be experienced. The first part of the course of the Canal, beginning at the north, is through a large but shallow lagoon called Lake Mensaleh, which has three communications with the sea through the strip of land on which Port-Saïd stands. The average depth of this lake is about 6 feet, but varying from 1 to 10 feet; and the plan adopted, implying enormous efforts brought against scarcely less enormous difficulties, was to dredge out a channel of the required depth, and then hem it in with two embankments rising 15 feet above the surface of the water. The Canal then proceeds through two smaller lakes, the soil of them all being very fine sand, which had to be worked through, of course under water, for about 30 miles. The next 25 miles or so are through a region of elevated sand-hills. It then passes through another small lake of the same character as the others, called Timsah—where, instead of cutting out a channel by dredging, the device has been resorted to of filling up the lake itself to the necessary level—and then through another region of sand. At this point, having completed about two-thirds of its course, the Canal enters upon the region known as 'the Bitter Lakes,' but which are the beds of ancient lakes, now dried up. There, as at Lake Timsah, the plan adopted

was artificially to fill the beds of the old lakes with water, and to indicate the route of the Canal—i.e., the deeper part of the channel—by buoys. This part of the course is about twenty-two miles in length. The few remaining miles, about thirteen, from the southern end of the Bitter Lakes to Suez, run through a rocky region, which presented great obstacles in the construction, but threatens no danger in the maintenance. The difficulties of obtaining perfectly adequate port accommodation at the junction of the Canal with the Red Sea have not yet been overcome. For the latter or southern half of its course, the Canal runs parallel with and at only a short distance from the railway between Alexandria and Suez. For about two-thirds of its entire course, the Canal runs through natural water or old water-channels.

“The depth is about 26 feet throughout, which will give admission to vessels of about 24½ feet draught. The width is 72 feet at the bottom of the Canal, and at the surface of the water is about 327 feet for part of the route, and rather less than 200 for the other. The maximum speed to be allowed is 6½ miles, and vessels will make the passage from sea to sea in 16 hours. There are no locks, the average level of the two seas being almost the same, though there is more tide in the Red Sea than in the Mediterranean by about 4 feet—a difference not sufficient to cause

any material flow for any considerable portion of the 24 hours in any part of the Canal, and, we should suppose, never affecting any part of it but the few miles between the Bitter Lakes and the Red Sea outlet.”

The ceremony of the opening of the Canal on 17th November 1869 is also described in graphic terms by Mr. Russel, from whose account we extract the following particulars:—

“About eight o'clock there was a movement among the vessels carrying royal personages, and hope revived. Soon afterwards the splendid steam yacht *l'Aigle*, bearing the Empress of the French, left her moorings, and entered the Canal; the other sovereigns or members of royal families followed according to precedence, or at least intended to do so, but there were some displacements; and throughout the day vessel followed vessel (all steamers, except one or two sailing vessels in tow) at short intervals. There were almost no private merchantmen, the vessels consisting of war-steamers and transport vessels belonging to different nations, and passenger ships of the great public companies trading between Europe and the East. The following, as near as we could see, was the order of this memorable and imposing procession:—

1. French yacht, '*l'Aigle*,' carrying Empress of the French.
2. Austrian yacht, '*Gräff*,' carrying Emperor of Austria.
3. Prussian yacht, carrying the Crown Prince of Prussia.

4. Swedish sloop of war, carrying Prince Oscar.
5. Russian yacht, carrying the Grand Duke Michael.
6. Vessel of the Russian Company, carrying the Russian Ambassador at Constantinople.
7. Dutch sloop of war, carrying Prince Henry of Holland.
8. British yacht, 'Psyche,' carrying Hon. Mr. Elliot, British Minister at Constantinople.
9. Russian war vessel, carrying Russian Admiral.
10. 'Peluse,' vessel of the Messageries Impériales Company.
11. British war tender, 'Rapid.'
12. French gunboat.
13. Austrian vessel, 'Vulcan.'
14. French corvette, 'Fourbin.'
15. French gunboat.
- 16 and 17. French steam yacht, towing English yacht 'Cambria.'
18. British vessel, 'Dido.'
19. British steam yacht.
20. Swedish vessel, 'Tonareg.'
21. British sloop of war.
22. Vessel of Messageries Impériales, 'Thabor.'
23. Vessel of Austrian Lloyd's, 'Pluto.'
24. Vessel of British Indian Telegraph Company, 'Hawk.'
25. Russian merchant steamer.
26. French merchant vessel, 'Europe.'
27. English vessel, 'Lynx.'
28. Italian screw, 'Principe Tomasso.'
29. Do. 'Principe Oddone.'
30. Italian steamer, 'Prince Amadeo.'
31. Austrian gunboat.
32. Italian steamer, 'Scilla.'
33. Austrian Lloyd's steamer, 'America.'
34. Egyptian Government steamer, 'Chabin.'
35. Egyptian Government steamer, 'Fayoum.'

"At least a score of others followed, the largest being made last in the procession, but the names of the second half of the fleet could not be obtained. There was moral as well as other grandeur in the spectacle of the

masts and flags of the far-stretching procession of vessels of all nations making their steady and stately way across the desert, the destined harbingers of a current of commerce and civilisation passing ceaselessly across those arid sands through the coming ages.

"For the first few miles on the route through Lake Mensaleh, where the banks, composed of the soil raised from the bottom by dredging, shelve very gently, the action of the water upon them in wake of the steamers was quite trifling, even as seen from a very large paddle-steamer placed about the middle of the procession. But soon, where the banks get steeper, though they are built of scrapings composed of mud rather than sand, and are slightly faced with stone, the 'wash' was seen to operate so strongly as apparently to ensure a gradual falling in, requiring pretty constant dredging and rebuilding. A few miles from the entrance a passenger took the improper liberty of sounding the canal, and found the depth 21 feet 4 inches, or about 7 feet below promise and announcement. About thirty miles from Port-Saïd we passed the vessel, the 'Latif,' which had been blocking the passage, but had been got out of the way. Hitherto all had gone pretty well, though slowly, and would have gone better but for our immediate predecessor being an ill-managed Egyptian steamer, which seemed more troubled with the breadth than the length of the road, and which, as she staggered about,

swept down the posts erected to mark the channel.

"Till emerging from Abu Bellah Lake, nearly forty miles from Port-Saïd, the Canal, whether passing through lakes or over the sand, is banked in on both sides by the material brought up in dredging. On emerging from Abu Bellah Lake, we enter upon a great cutting of about four miles, where the Canal has been dug through high-lying sands to a depth at the maximum of nearly 55 feet. At this place, the Canal at the surface does not seem so much as 180 feet broad. The sufficiency of the embankment is thus tested under other conditions than hitherto: the Canal is narrower, and the banks, owing to the great difficulty and cost of sloping them farther backwards, go sheer into the water at a dip apparently of about 1 in 2. This portion of the Canal has been in use for boats of small draught employed in M. de Lesseps' own operations for about nine months, so that it may be said to have been already mildly tested. The result, so far as can be judged, is not altogether satisfactory. The banks have stood somewhat better than people who saw them when first made had expected; but there are abundant proofs of crumbling, and threats of much more. The 'wash,' as the vessels pass along, is very violent, and the banks are seen to suffer under its operation. All along, the banks at the edge of the water are indented with little bays where the sand has fallen

in; large portions close to the water-edge are seen to be honey-combed, and so rapidly nearing their fall, and a foot towing-path at the bottom of the embankment is already, within this cutting, washed away in very many places. Our soundings about half through the cutting showed 25 feet, being the highest shown during the passage, and yet 3 feet below the promised and intended maximum. It may thus be safely concluded that the Canal is as yet utterly impracticable for vessels drawing $26\frac{1}{2}$ feet, which are invited by the Company's advertisements. And it is to be feared that the soundings did not bring out the worst of it. Our vessel drew somewhat less than 14 feet; but repeatedly, and for considerable periods, during the night of the 17th, we felt those grinding and *slotting* motions which indicate that a vessel is scraping the bottom—it is often felt in vessels forcing a way over the soft-bottomed shallows off Rotterdam."

The following anecdote depicts how the case was viewed by a British skipper, even when the canal was actually ready for use. Two days before the opening of the Suez Canal, the captain of a steamer which was appointed to form part of the procession replied to an inquiry as to when they should reach Suez—"Perhaps in ten years' time, not a day before." After the passage had been effected, and his vessel was riding at anchor in the water of the Red Sea, the inquirer met him again

and was saluted by him with the remark, "I always told you we should get through all right." And the odd part of the incident was that both statements were made in perfect good faith. The spectacle of the brilliant success which had attended the opening had had such an influence upon his imagination that he had completely forgotten his previous scepticism.

"In executing this strange work of the desert," says the writer of the article "Canal" in the ninth edition of the *Encyclopædia Britannica*, "and converting dry sands into navigable lakes, it is stated that there have been about *eighty millions* of cubic yards of material excavated, and at one time sixty dredging machines and nearly 30,000 labourers were employed. . . . The cost of the whole undertaking, including the harbours, is stated to have been about £20,000,000. The terminal harbours are important adjuncts to this great work. That on the Mediterranean is Port-Saïd, which is formed by two breakwaters constructed of concrete blocks, the western one 6940 feet in length and the eastern 6020 feet, enclosing an area of 450 acres, with an average depth of only 13' or 14 feet, excepting in the channel leading to the canal, where the depth is 25 to 28 feet. The entrance to the canal at Suez is also protected by a breakwater, and in connection with the harbour at this place there are two larger basins and a dry-dock. The canal may be regarded as a highway for

steamers of 400 feet in length, and 50 feet beam. A delay of three days is calculated on for the passage across from Port-Saïd to Suez."

The results of the canal in respect to the traffic have been abundantly satisfactory. Without giving the statistics in detail, the progress for three separate years may illustrate how the business has grown. In the first year (namely 1870), 486 vessels, of a tonnage of 654,915, passed through the canal, and the revenue was £206,373. In 1873, the vessels numbered 1173, the tonnage reached 2,085,072, and the receipts £915,892; while in 1875 the number of vessels had been 1494, with a total tonnage of 2,940,708, while the revenue reached as much as £1,155,452. The most remarkable feature in those figures seems to be the increased average tonnage of the vessels passing through, showing that ships of larger draught than were at first ventured over the route now habitually use it. In many respects the opening of the canal has revolutionised the trade between Europe and the East, and so far from the expectation proving true that it would be chiefly used for cargo-vessels, passenger steamers for India, etc., passing through the canal, are largely on the increase. Even Mr. Russel, whose views on the canal were enlarged and far-seeing as contrasted with those of most British journalists, said it would be "of no great avail for passengers," and

that, as all the canal would save them would be transshipment, those who have weeks of sea before them would still look on landing as a pleasure, and a day or two in the famous land of Egypt as a coveted advantage.

These views have hardly been justified by the result. As regards what the croakers said, it may be sufficient to remark with a recent writer that "Port-Saïd has not been choked up by a deposit of Nile mud; the canal has not been filled by the sand blown into it from the desert, and the water in it has not been carried off by evaporation—all which misfortunes, it was confidently asserted, six years ago, were certain to happen."

The political aspects of the recent purchase of the Suez Canal shares by the British Government are worthy of some notice. It was a notable instance of the whirligig of Time bringing about his revenges to see the nation which had openly scoffed at the project getting into such a ferment of delight over the action of the Government in the matter. And it may be remarked, that amidst the numerous criticisms to which the act has given rise, both as regards the political wisdom and the mercantile value of the investment, one cannot forget the real point, namely, what would Britain have said had any other European power than itself secured the property which it was but too evident the Khedive was bound to sell?

Towards the end of 1876,

Professor Monier Williams, the well-known Sanscrit scholar, sent to the *Times* an interesting account of the condition of the Suez Canal, from which we extract the following paragraphs:—

"If the present threatening aspect of political affairs in the East continues, facility of access to our Eastern possessions will become a matter of supreme importance. The tide of public interest, therefore, is likely to set in the direction of Egypt and the Suez Canal. This Canal has, in fact, turned the Red Sea into an arm of the Mediterranean. The island of Perim, in the Straits of Babelmandeb, and the Rock of Aden are now the pillars of the eastern portal of the Mediterranean, just as the old Pillars of Hercules form the gate of its western entrance. No one who has made the voyage to India and seen Gibraltar, Malta, Perim, and Aden, can believe for a moment that, with these strongholds in our possession, there is any fear of the Mediterranean becoming either a French or Russian lake. Having myself twice passed from Port-Saïd to Suez during the last twelve months, I am induced to think that a brief narrative of my experiences and some account of the present condition and prospects of a work which is changing the character of the great inland sea, and is destined to revolutionise the commerce of the world, may interest the readers of the *Times*. . . .

"The entrance to the Suez Canal at Port-Saïd is certainly

not imposing. The adjacent coast for miles is apparently below the sea-level, making the approach to the harbour almost impossible except by daylight; but a lofty lighthouse which was cleverly constructed by erecting wooden moulds one above the other and filling them with concrete, stands on a pier on the right, and gives out a flashing electric light, visible at an immense distance. There are also two long breakwaters, one longer than the other, constructed of huge blocks of concrete, running far into the sea on either side of the harbour, which effectually prevent the sand from drifting inside and choking the mouth of the Canal. . . .

"In half-an-hour we had paid the dues, which I believe amounted in our case to about £1500, and had entered the Canal, the entrance being merely a continuation of the harbour, without lock-gates of any kind. Here, on the right, there is a narrow strip of land covered with sheds, owned by the British nation. I was informed that when the works commenced this land was offered to our Government for £800, and was declined. It is said to have been recently purchased by us for £26,000. This story will not appear incredible to any one old enough to remember the view Lord Palmerston took of the French engineer's great project.

"Although the course of the Canal for the first 30 miles is as straight as an arrow, every part of it abounds with interesting objects.

The first thing noticed is an immense lagoon stretching for miles beyond the right bank, while on the left lies a trackless desert of sand, with here and there patches of what appeared to be water, but was really nothing but the mirage produced by heated vapour. Then there are the natives on the bank in their picturesque costumes, the sturdy, half-naked Arabs at work in the water, the strings of camels with their burdens, the feluccas in the lagoon with their lateen sails, the myriads of water fowl, and in the horizon long lines of flamingoes extending literally for miles, and standing motionless, like regiments of soldiers in white uniforms. But the one absorbing sight of all is the Canal itself. Such expressions as 'One of the wonders of the age,' 'A triumph of engineering skill,' give an inadequate idea of the magnitude of the work. It must be seen to be estimated at its right value. . . .

"Two large steamers (the *Hibernia* and *Seine*), laden with submarine cable, have just accomplished the passage. One of them, however, drawing 24 ft. 7 in., scraped her keel all through the Canal, and was obliged to steam at full speed to bring her through. The only difference in the level of the sea at the Mediterranean and Red Sea extremities is caused by the difference in the tides, the variation at the Mediterranean end being 18 in. in spring tides, and that at the Red Sea end about 7 ft. or 8 ft. The effect of these differences is to cause a current at both

extremities, and of course a tolerably strong flow from the Red Sea towards the great Bitter Lakes, situated near the centre of the Canal.

"Every six miles there is a station-house (*gare*) and siding with signal-posts, fitted with black balls, by means of which the traffic is worked on the block system, and, as a rule, no ship is allowed to take less than one hour in steaming from one station to the next.

"Two ships advancing towards each other in opposite directions are never allowed to meet while in motion. One is compelled to draw off to a siding while the other passes. This happened to us at a station called Kantará, where we were made to shunt while the *Diomed*, a Liverpool steamer, passed us. Here a road—once the great highway between Egypt and Palestine, and still a high road between Cairo and Syria—leads over the Canal by a kind of flying bridge. A large caravan from Jerusalem, with hundreds of camels and a motley crowd of way-worn travellers—men, women, and children—were waiting to pass over close to our siding. It was a strange and interesting sight, which made us think of the going down of the Children of Israel into Egypt. Thence we glided on without interruption, but with the disagreeable accompaniment of an Egyptian plague of flies, passing on the right a statue of Lieutenant Waghorn, the pioneer and first organiser of the over-

land route in 1837. At considerable intervals steam, dredging-machines—four or five of which are now sufficient to keep the bed clear—were seen in active work. One was of monster proportions, and appeared to be ingeniously constructed for raising the sand from the bottom and delivering it on an inclined plane over the bank. The desert is occasionally dotted with patches of a kind of scrubby bush, the only merit of which is that it serves to relieve the glare from the sand, and to furnish food for camels. Here and there high banks of sand hid everything from our view. At 4 in the afternoon (having left Port-Saïd at 7 in the morning) we emerged in the first bitter lake, called Lake Timsah, steaming at increased speed close to the new town of Ismailia, named after the Khedive.

"On we steamed through the lake, and thence through a cutting to the second or great bitter lake, where we anchored for the night soon after sunset. These two remarkable lakes had nearly dry beds before the making of the Canal. That happened to them which is now going on in the Dead Sea. The water had evaporated, and left a deposit of seven or eight feet of solid salt. The French engineers foresaw that this circumstance might be turned to account for the deepening of the centre channel. When the waters of the Red Sea were allowed to flow in, the layer of salt was dissolved and nearly eight

feet of depth gained. The climate in the neighbouring districts is likely to be advantageously affected by the re-creation of these lakes. We had evidence next morning of an accession of humidity which may one day turn barren ground into fruitful fields. When we attempted to move on soon after daybreak, a thick mist enveloped us, and kept us stationary for more than an hour. Meanwhile, our ship's stern stuck in the sand, but with a little wriggling worked itself off. Then we glided out of the great lake through a deep cutting, which extended for some miles. At one o'clock the same afternoon we had entered the Gulf of Suez, and were steaming rapidly towards one of its spacious open docks and quays (constructed at an immense cost) almost before we became aware that we had emerged from the Canal, having accomplished the whole distance of 100 miles in about 15 hours. The total cost from first to last of the miracle of engineering skill which had transported our huge ships from one sea to the other so easily and pleasantly was only 18 millions. About two millions of the amount was freely given by the late Khedive in money and labour. The compulsory system was first tried, but soon given up. Cholera broke out, and English public opinion was brought to bear on the matter.

"Then it was that the genius of M. de Lesseps organised a system of paid labour, the extraordinary success of which in a

country like Egypt could never have been predicted. All honour to the indomitable will and scientific ability of one man, who, fighting his way through apparently insuperable obstacles,—physical, social, and political,—carried out one of the greatest projects of this wonder-working century.

"But in appreciating to the full his energy and intellect, let us not withhold a tribute to the amazing tact and administrative capacity which enabled one man to train a whole army of ignorant and illiterate labourers, and inspire them with something of his own ardent, energetic, and enthusiastic spirit. Every individual, to the smallest donkey-boy employed on the Canal, seemed to take a pride and pleasure in doing his allotted task well, and contributing something towards the desired end. No great work has ever before been effected in Egypt with so much good will, cheerfulness, and activity, and with so small sacrifice of human life. This will appear more remarkable when it is borne in mind that nearly a hundred steam dredging-machines were in constant operation, for the effective working of which a large number of men and boys with interdependent duties was indispensable.

"And yet, after all, notwithstanding one's admiration of this great monument of scientific and administrative genius, it is singular that the chief impression it leaves on one's mind is that of

incompleteness. The simple truth I believe to be that before the Canal can be pronounced really finished the width of the central channel must be doubled, and the banks from one end to the other lined with stone. If, when the success of the project was assured, and before the costly plant had been sold and the trained labourers dispersed, the principal European Powers had agreed to act in concert, each contributing its quota of a few millions, a really complete result might have been achieved, the capital expended might have been blotted out, and a canal of the right dimensions presented to the commerce of the world. Now the whole plant will have to be reconstructed, new workmen and labourers trained, and the entire process reorganised at a vast cost. Nevertheless, English enterprise and capital can do all that is needed, and English enterprise and capital will have to do it in the end. So surely as Russia is setting her face steadfastly towards Constantinople must England concentrate her attention on Egypt, Port-Saïd, and the Suez Canal. The day may be coming—and perhaps must come very soon—when no corner of Europe will be allowed to suffer any longer from the ‘impotence’ of Turkish rule. What then is to happen to Egypt? England’s duty will be plain. We shall have to take the Khedive in

hand ourselves, make him an independent Sovereign, and peremptorily insist on his governing his country well, righteously, and economically. To this end we must help him, not with money, but with men.

“We have a whole band of Indian civilians—men like Sir George Campbell, Mr. Seton-Karr, and Mr. Cust—who have served their time in India and yet have plenty of energy left, which they are ready to devote to the welfare of their fellow-creatures. Let them be lent to the Khedive, and simply do in Egypt the work they have done in India as Commissioners, Collectors, Judges, Magistrates, Members of Council, and Lieutenant-Governors. The Province adjacent to the Indus, commonly called *Sinde*, has been significantly styled ‘Young Egypt.’ Old Egypt and ‘Young Egypt’ have certainly much community of character and many points of resemblance. Those who have made ‘Young Egypt’ prosperous under a strong, righteous, and energetic administration, are quite competent to raise old Egypt out of the depths of misgovernment into which she is fast sinking, and convert her from a poverty-stricken into a rich and thriving country. I submit that this is the only true solution of the Eastern Question, so far, at least, as England is concerned.”



THE STEAMER.

CHAPTER I.

Then take thy way, adventurous skiff,
More daring far than Hippogriff,
And be thy own delight.

WORDSWORTH'S *Peter Bell*.

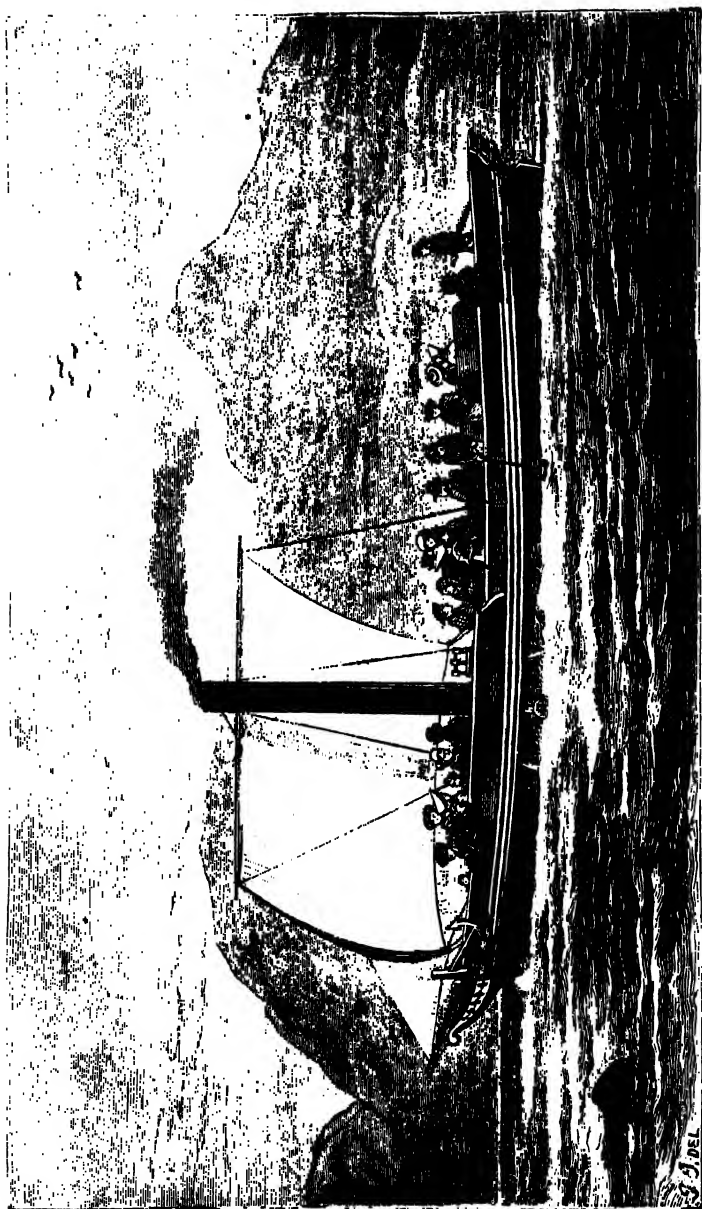
TRAVELLING BY WATER—THE RIVER HOY—FIRST ESSAYS IN STEAM
NAVIGATION—CONTINENTAL INVENTORS—MILLER AND SYMINGTON.

TRAVELLING BY WATER.

THE Marquis of Worcester's title, "The Century of Inventions," is one that may most aptly be applied to the history of the steam engine. There is no mode of progression amongst those treated in this volume which presents so uniform a history of advancement, such universal adoption by all the nations of the world, and so distinct a prospect that its usefulness will continue to extend.

We have seen that last century the roads were so bad, and the desire for travel was asserting itself so unmistakably, that while the invention of canals was hailed with great anticipations that through them communication between inland towns would be greatly facilitated, a very large trade both in passengers and goods was being developed by means of "smacks" and other coasting vessels navigating the stormy waters that surround our sea-girt islands. It was

a characteristic mark of the insular mind when Johnson's biographer referred to the sea as "that universal medium of connection amongst mankind." But it was not less characteristic of the dangers and discomforts which then attended the use of this "universal medium," to find the sage of Fleet Street a few days before the date of Boswell's remark saying that "no man would be a sailor who has contrivance enough to get himself into a gaol; for being in a ship is being in a gaol, with the chance of being drowned," or on another occasion, ten days afterwards thus expanding his idea:—"A man in a gaol has more room, better food, and commonly better company, and is in safety." "Ay but," said Mr. Macqueen, "the man in a ship has a pleasing hope of getting to shore." JOHNSON: "Sir, I am not talking of a man's getting to shore, but of a man



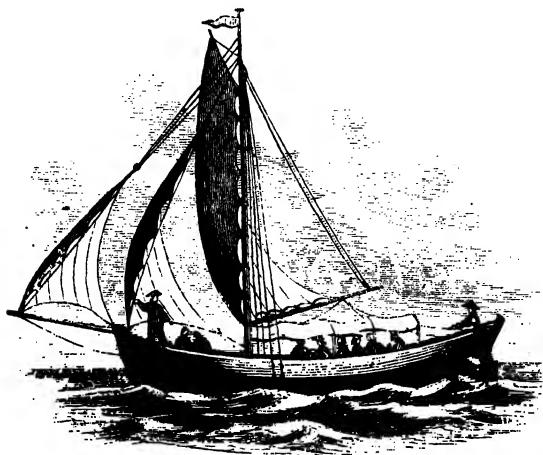
HENRY BELL'S STEAMER 'COMET'—1811.

while he is in a ship, and there I say he is worse than a man when he is in gaol. A man in a gaol may have the *pleasing hope* of getting out. A man confined for only a limited time, actually has it."

THE RIVER HOY.

It is interesting, on the eve of an invention which is destined to

revolutionise any system, as steam has revolutionised the science of navigation, to turn to a contemporary picture of that system as it existed at the period. How a holiday was spent by the tourists of a century and a half ago, is well illustrated in Hogarth's *Five Days' Perigrination* in 1732, of which an amusing and copiously illustrated description was published at the time, and has been recently



reproduced. The accommodation offered to men of education who were willing to pay the expense of such a journey may be gathered from this curious book :—

"The tide was strong, fair was the wind ;
Gravesend was soon left far behind,
Under the tilt on straw we lay
Observing what a charming day,
There, stretched at ease, we smoke and drink,
Londoners like."

Before we proceed to touch upon the invention which rendered such a pleasure excursion as this of Hogarth's almost an impossibility, except amongst people who take to boating from choice, we may notice that the Hoy or tilt boat, gradually improved from Hogarth's day, continued to be a recognised institution for some years into the present century, while the sea-going smack is a thing which still

lingers in the memory of some of the oldest inhabitants. We have an illustration how readily the traveller over the bad roads of last century took to the water when opportunity offered, notwithstanding the meagreness of the accommodation it afforded, in the following extract from Skrine's *Tour through Wales*, in 1795, embraced in Pinkerton's collection:—"The navigation of the Wye from Ross to Monmouth and Chepstow offered a temptation that we could not resist, and having secured a good covered boat, well stored with provisions, we embarked for this expedition at the foot of Wilton Bridge. . . . Soon after we passed Llandogue and Brockware, we were obliged to wait for the tide, as the shoals beyond that spot are impassable except at high water, and our boatmen were fatigued with their exertions against the wind. Unfurling our canvas awning, we enclosed ourselves in the boat, and excluded all objects during the time of dinner, to protect ourselves from the cold. . . . At Chepstow our little voyage concluded, and the superior accommodations which we found at the Beaufort Arms were not unwelcome after the cold we had experienced on the water."

An illustration of the use of the passenger Hoy early in the present century is quoted by Sydney Smith in his first paper on Methodism, in the *Edinburgh Review*, where we read of the "religious Hoy" (as the essayist terms it) the 'Princess of Wales,' which sailed for

Margate weekly, and regarding which Sydney Smith quotes a correspondent of the *Methodist Magazine*, who says: "To those who are in the habit of visiting the Isle of Thanet in the summer, and who, for the sea air or from other considerations, prefer travelling by water, such a conveyance must certainly be a *desideratum*, especially if they have experienced a mortification similar to that of the writer in the course of the last summer when shut up in a cabin with a mixed multitude, who spake almost all languages but that of Canaan."

It is perhaps hardly necessary to dwell on the difficulties and dangers which were encountered by sea-going vessels in the olden time. From Hay's *History of Arbroath* we obtain the following reminiscence of a period long previous to that of which we are now dealing, and indicating that men may be very wise and learned, while yet enjoying what we consider but rudimentary facilities for communication with their kind:—

"The abbots of Arbroath had the privilege of conferring minor orders, and of consecrating the furniture of the altar. This privilege was obtained from Rome on their own request, and on account of the perils attendant on crossing the sea from Arbroath to St. Andrews, a reason which gives a glimpse into the difficulties of travelling in those times." The same writer shows, however, that half a century ago his townspeople, though they might make longer voyages

than the abbots, did not enjoy facilities or comforts much greater than their predecessors :—

“As to passenger traffic by sea, the ‘Ruby’ and ‘London,’ Arbroath and London smacks, afforded the means of making acquaintance with the capital, but that was a

voyage which, being an event in a lifetime, was not to be gone about without much consideration and preparation.” Even then, as in the case of a land journey of the same length, men made their wills before starting upon the perilous journey in a London smack



The horrors of the middle passage in the Channel were vividly in every traveller's mind, and when the genial Canon of St. Paul's recalls in his seventy-third year that he had "been nine hours in sailing from Dover to Calais before the invention of steam," he is only expressing in a condensed form the gratitude which every voyager

to the continent owes to the invention of steam navigation.

FIRST ESSAYS IN STEAM NAVIGATION.

As in the case of most great inventions, the claimants to the honour of having been first in the field are numerous, and sixty or seventy

years ago it might even have been a dangerous thing, as undoubtedly it would have been a delicate one, to express any very decided opinion as to who was the inventor or maker of the first steam-vessel.

The following story is given in Stuart's *Anecdotes of the Steam-engine*, but there seems to be some doubt of its authenticity :—

“Blasco de Garay, a sea-captain, exhibited to the Emperor and King Charles V., in the year 1543, an engine by which ships and vessels of the largest size could be propelled, even in a calm, without the aid of oars or sails.

“Notwithstanding the opposition which this project encountered, the Emperor resolved that an experiment should be made, as in fact it was, with success, in the harbour of Barcelona, on the 17th June 1543.

“Garay never publicly exposed the construction of his engine, but it was observed at the time of his experiment that it consisted of a large caldron or vessel of boiling water, and a movable wheel attached to each side of the ship.

“The experiment was made on a ship of 200 tons, arrived from Calibre (?) to discharge a cargo of wheat at Barcelona ; it was called the Trinity, and the Captain's name was Peter de Scarza.

“By order of Charles V. and the prince Philip the Second, his son, there were present at the time Henry de Teledo the governor, Peter Cardona the treasurer, Ravago the vice-chancellor, Francis Gralla, and many other persons of

rank, both Castilians and Catalonians ; and among others several sea-captains witnessed the operation, some in the vessel and others in the shore.

“The Emperor and Prince and others with them applauded the engine, and especially the expertness with which the ship could be tacked. The treasurer Ravago, an enemy to the project, said it would move two leagues in two hours. It was very complicated and expensive, and exposed to the constant danger of bursting the boiler. The other commissioners affirmed that the vessel could be tacked twice as quick as a galley served by the common method, and that at its slowest rate it would move a league an hour.

“The exhibition being finished, Garay took from the ship, and having deposited the wood-work in the arsenal of Barcelona, kept the rest to himself.

“Notwithstanding the difficulties and opposition thrown in the way by Ravago, the invention was approved ; and if the expedition in which Charles V. was then engaged had not failed it would undoubtedly have been favoured by him. As it was, he raised Garay to a higher station, gave him a sum of money (200,000 maravedies) as a present, ordered all expenses of the experiment to be paid out of the general treasury, and conferred upon him other rewards.

“Such are the facts collected from the original registers preserved in the royal archives at Simancas, and among the public

papers of Catalonia and those of the Secretary at War for the year 1543."

We may be disposed to agree with the editor of the *Franklin Journal*, who, in quoting the above narrative, says that its authenticity is not such as to incline him to begin the history of the invention of the steamboat as far back as 1543.

In going backwards, however, upon the history of the subject, one is amazed to find that no secure resting-place can be got, so long as theory only is looked at. There is almost no individual part of the act of applying steam to the propulsion of a vessel that does not appear to have been invented, or at least suggested, long before it was practically applied. Two years before Hogarth's adventure in the river boat, John Allen, in a book entitled *Specimina Ichnographia; or a brief Narrative of several New Inventions*, described a mode of navigating a ship in a calm. The way he proposed to get a power and avoid the defect which he says had attached to every method that had been practised or proposed, was to form a tunnel or pipe open at the stern or hinder part of the vessel; and by means of a pump to force water or air into it through the sea. By the reaction which this would occasion, the ship would be driven forward "very accurately, imitating what the Author of nature has shown us in the swimming of fishes, who proceed in their progressive motion, not by

any vibration of their fins as oars but by protrusion with their tails; and water-fowls swim forward by paddling with their feet behind their bodies." Dr. Allen carried his scheme into practice in a boat of considerable size. His invention merits its place here from the circumstance that he suggested the use of a steam-engine to pump the water or air which was to form the motive power, and he had "no manner of doubt that, if a couple of them were applied to a ship of fourteen or fifteen hundred tons they would impel it at the rate of three knots an hour." It is curious to note that a century later an elaborate adaptation of Dr. Allen's idea was described in the *Mechanics' Magazine*, the designer being, however, modest enough to allege that his proposal only showed the "probability of steam vessels being propelled without paddles and the usual cumbrous machinery of cylinder, piston, etc., by the action of the steam almost immediately against the resistance of the water."

When Captain Savery, in 1699, obtained a patent for the first steam-engine, applicable, as all the earlier projects for the employment of steam were, to the mere raising of water, he indicated, vaguely indeed and humbly, that it might also be applied to maritime purposes. In most histories the first place in advancing to a practical realisation of this is generally assigned to Jonathan Hulls, who, as far back as the 21st of December 1736, took out

a patent for "A new invented Machine for carrying Vessels or Ships out of or into any Harbour, Port, or River, against Wind and Tide, or in a Calm ;' and in the following year published a pamphlet of forty-eight pages at London, which is now extremely rare, detailing at length the nature of his invention. Mr. Hulls' 'new invented machine,' as we shall presently show, was nothing else than a tow-boat moved by steam.

In the introduction to his pamphlet, he prophetically remarks, "There is one great hardship lies too commonly upon those who propose to advance some new though useful scheme for the public benefit, the world abounding more in rash censure than in a candid and unprejudiced estimation of things ; if a person does not answer their expectation in every point, instead of friendly treatment for good intentions, he too often meets with ridicule and contempt." We are willing to think that there is less of this ungenerous feeling to be met with now-a-days than formerly ; and yet even at the present time how many are the projects of genius for the benefit of mankind, which are thrown aside, neglected and condemned ? How can we be certain that our children's children may not have as much cause to wonder at the stupidity of their grandsires in not adopting some palpable improvements revealed to them, as we have to wonder at the stupidity of ours in leaving untried so fair an invention as the steam-

boat, when once proposed to them in a manner so clear and satisfactory as we shall find it was done by Mr. Hulls ? Like all sanguine projectors, he had some hope that their common fate would not be his, but that his contemporaries would "form a judgment of his present undertaking only from trial." Still he had his misgivings ; but, with the true spirit of an Englishman, he makes it his consolation that, some time or other, the merits of the invention will be recognised ; and that, when the author of it is beyond the reach of praise or reward, *his country* may reap the benefit. "I hope," he says, "that, through the blessing of God, it may prove serviceable to MY COUNTRY."

In Newcomen's atmospheric engine, the principle of which was adopted by Jonathan Hulls, and which was patented in 1705, the condensation and not the pressure of steam was the motive power, and the return motion of the piston was effected by the action of gravitation through weights hung on the other end of the beam. In Savery's engine, used for pumping, and projected earlier than Newcomen's, the elasticity of the steam was so far utilised, but only in a secondary and auxiliary way. To James Watt belongs the honour of inventing the direct action of steam in the cylinder, and that in both the forward and return motion of the piston. While, therefore, Hulls' invention might have proved "serviceable to his country," in default of a better, the steam engine

proper was not invented till half a century after his day, while a century elapsed between Newcomen's interesting invention and the working out of steam navigation.

The reasons which induced Jonathan Hulls to be of opinion that his machine could not be employed in the vessel itself which was to be moved against wind and tide, or in a calm, but in a separate tow-boat, were these : —“ 1. This machine might be thought cumbersome, and to take up too much room in a vessel laden with goods, provisions, etc. 2. If this machine is put in a separate vessel, this vessel may be at any port, etc., to be ready on all occasions. 3. A vessel of a small burthen will be sufficient to carry the machine to take out a large one. 4. A vessel will serve for this purpose for many years, after she is thrown off, and not safe to be taken far abroad.”

It will be seen that he limited his views of the usefulness of the steamboat to towing vessels or ships out of, or into any harbour, port, or river, at all times, and in all weathers ; but it is needless to say how vastly important its adoption even to that extent would have been.

He was so satisfied of the certainty of the principle of his invention, that he conceived it might be carried to any manageable extent. “ *The bigness of the machines,*” says he, “ *may be proportioned to the work that is performed by them ;* but if such a force as is applied in this first essay be not

sufficient for any purpose that may be required, *there is room to make such addition as will move an immense weight with tolerable swiftness.*”

The merits of Jonathan Hulls as the pioneer in the science of steam-navigation have been recognised in the following generous way by a modern writer : —

“ The real truth is that neither Mr. Fulton, nor Lord Stanhope, nor even Patrick Miller, has any claim either to the invention of applying a steam-engine to a boat, or the apparatus of wheels or other machinery to propel her through the water. A very humble treatise printed in London in the year 1737, with the title, ‘ A description and draught of a new-invented machine for carrying vessels or ships out of or into any harbour, port, or river against wind or tide, or in a calm, for which his Majesty George II. has granted letters patent for the sole benefit of the author for the space of fourteen years. By JONATHAN HULLS,’ has a plate of the stout boat with a chimney (as at present) smoking, a pair of wheels rigged out over each side of the stern, moved by means of ropes passing round their outer rims ; and to the axis of these wheels are fixed six paddles to propel the boat. From the stern of the boat a tow-line passes to the foremast of a two-decker, which the boat thus tows through the water.

“ This volume contains a number of theorems respecting the specific gravity of bodies and the pressure of the air, together with

their demonstrations. It describes the rude steam-ship as used at that time ; and thus concludes : ‘ Lastly, the atmosphere, being of a great weight, and striving to get in where there is a vacuum, I shall endeavour to show how this vacuum is made and in what manner this force is applied to drive the machine. In some convenient part of the tow-boat there is placed a vessel about two-thirds full of water with the top close shut ; this vessel being kept boiling rarefies the water into a steam ; this steam being conveyed through a large pipe into a cylindrical vessel, and these condensed, makes a vacuum, which causes the weight of the atmosphere to press on this vessel, and so presses down a piston that is fitted into this cylindrical vessel in the same manner as in Mr. Newcomen’s engine with which he raises water by fire.’ And he thus concludes : ‘ The scheme I now offer is practicable, and if encouraged will be useful ! ’ After this there can be no longer any question to whom the inventor of the steamboat is due—JONATHAN HULLS is the person.”

The reference to Earl Stanhope in the above extract from the *Quarterly Review* is to his plan of working a vessel by means of “ flappers ” like the foot of a duck or the limb of a tortoise fastened upon the outer side of the vessel. But the duck’s feet refused to close, so that the act of drawing them back retarded the vessel very nearly as much as the forward motion pushed it forward, and the

invention proved useless. Lord Stanhope had a vessel built in the Thames about 1790, into which he put an engine of great power. It was brought to act on machinery which produced a horizontal stroke, and returned by the side of the vessel ; but, as above stated, the reaction was found to be so great, that the impulse produced on his vessel, a *flat-bottomed one*, did not exceed three miles per hour. His Lordship had a hint at the time that a rotatory motion would answer the desired purpose.

CONTINENTAL INVENTORS.

In the course of the eighteenth century several persons on the continent of Europe made earnest endeavours to solve the question of applying steam to the purposes of navigation, their ideas following in many cases the same train as those of Allen and other British inventors. In 1757, the French Academy of Sciences made the propulsion of vessels by other aids than wind or oars the subject of their prize essay, when Bernouilli, while suggesting several methods—gunpowder amongst the rest—gave the preference to paddle-wheels moved by steam ; while Canon Gautier, in his essay, propounded several methods, displaying “ such clear, and distinct notions, on a perfectly novel and difficult subject, unfamiliar to a man who had always lived in an inland town and totally ignorant of maritime affairs,” as to excite surprise. M. Genevois, a pastor

in the canton of Berne, published a book at Geneva, in 1759, in which he enunciated a plan for this end, and in 1760 he came to London to lay his proposals before the Commissioners of the Navy. Genevois had found that common oars "had ten essential faults," and that principally because the Supreme Geometrician had not given a pattern in any living creature, which he held was a strong objection to the goodness of this method of propelling a boat. Taking the action of the duck's foot as his guide, he proposed to use oars with a joint at the feather, expanding so as to be quite flat when opposing the water, but folding together when they were withdrawing from it. His suggestion was to look to springs as a magazine or repository of power, and to bend the springs he proposed to use the steam-engine. He had at first proposed to use gunpowder for this purpose, and in connection with this he tells a curious story. When he appeared before the Navy board in August 1764, he was told that about thirty years before a Scotchman had proposed to make a ship sail by means of gunpowder, but that as thirty barrels of gunpowder had been used before the vessel advanced ten miles, the invention had been rejected. He was told that it was by the retrogradation of one or more cannons on the poop that this native of Scotland had proposed to propel the vessel, and this the Bernese inventor makes the peg on which to hang

another story, illustrative of the efforts being made in many places to discover a new means of navigation. "This put me in mind," he says, "of the trial a celebrated gentleman made, many years ago, to set a boat going on the Rhine by the effusion of water from a tub on the stern by a hole towards the prow!" As regards the Scotchman's proposal, Genevois adds, "One may easily see it has nothing in common with mine, but the thought of gunpowder."

In 1774 the Comte d'Auxiron, an artillery captain, brought forward a scheme for moving a boat by means of a steam-engine, and made an experiment on the Seine, at Paris. The engine had not, however, the requisite force, and the boat is stated to have moved so slowly and irregularly, that the company at whose expense the trial was made thought there was no inducement to persevere, as, from what they had seen, navigation by steam could not supersede either in speed or economy the ordinary method of towing by horses!

Not so, however, thought Jacques Constantin Perier, a member of the Academy of Sciences, who was witness of this experiment, and who repeated it in the following year. He used a steam-engine of about one horse-power, and had it fitted into a boat, to which were affixed a pair of wheels. He was not, however, more successful than d'Auxiron, as the boat moved but slowly against the strong current of the river Seine, and for a time he turned his attention to other pur-

suits in the engineering line on which he was engaged. Perier's experiment was witnessed by the Marquis Ducrest, who held that the experiment had not been fairly made, for that a boat to be driven against the stream of the Seine at the ordinary velocity of the towed boats, should have had an engine of from four to five horse-power. Under the opinion of this nobleman, given in his *Essais sur les Machines Hydrauliques*, published in 1777, Perier, some years afterwards, made other experiments, substituting other mechanism for that of paddle-wheels, to which, as defective substitutes for oars, he attributed his first failure. "But he was too languid in his pursuit," says Stuart, from whose *Anecdotes* those particulars are derived, "to accomplish so great a matter; his attempts do not appear to have excited much attention in France, and no traces appear of their having been noticed in England." In 1781, a further experiment was made by the Marquis de Jouffroy, who put a boat 130 feet long, with two paddle-wheels, upon the river Saône, and succeeded in producing greater results than any of his countrymen who had previously tried it. In the year 1796, another Frenchman, des Blancs of Trevoux, took out a patent for a steamboat, but no practical use was made of it. We should perhaps include under this head Fulton's first attempts at the propulsion of a boat, which were made in Paris in 1797, in company with Joel Barlow. His plan then was

"to impart to carcasses of gunpowder a progressive motion under water, and there to explode them," but the machine did not answer his expectations.

MILLER AND SYMINGTON.

It is not necessary at this time of day to enter upon the great dispute that once raged, whether the invention of steam navigation should be assigned to Mr. Miller of Dalswinton, to Mr. James Taylor, or to William Symington. To Mr. Miller certainly belongs the credit of having tried to move a boat upon Dalswinton Loch by means of paddles. It is equally certain that before being introduced to Symington, the latter had invented a steam carriage of an ingenious character. The claims of Mr. Taylor have been, by Symington's friends, declared to be no more than this, that, seeing Symington's model of his steam carriage, and Mr. Miller's paddle vessel, to him belongs the merit of "putting that and that together," and suggesting the idea to Mr. Miller, while the actual application of the steam to the paddle rests with Symington.

The utmost that can with any feasibility be claimed for Mr. Miller, in relation to steam navigation, is the application of paddle-wheels, in place of sails or oars, to the propulsion of vessels. Even as regards this, however, Mr. Miller's claims to originality may be very fairly disputed. In a *Treatise on Shipbuilding* by one Witsen, published at Amsterdam

in 1621, there is an engraving of what is called a Liburnian (Leghorn) vessel, *propelled by paddle-wheels turned by oxen.*

A narrative, proving the right of the late William Symington, civil engineer, to be considered the inventor of steam land carriage locomotion, and also the inventor and introducer of steam navigation, by Robert Bowie, was published in 1833.

The Narrative is stated to have been "drawn up from a memorial presented to the Lords of his Majesty's Treasury in behalf of William Symington, and from documents in the possession of his family." The general purpose of it is to show that the late William Symington was the inventor both of steam navigation and of steam land travelling; but that he derived from these important inventions neither the honour nor the profit to which they justly entitled him:—

"Mr. Symington was a native of Leadhills, in Lanarkshire. He received an education for the church, but an early predilection for mechanics led him to abandon his theological studies. Before completing his twenty-first year he had made several improvements on the steam-engine; and, having protected them by letters patent, constructed and introduced engines on his principle into different parts of England and Scotland. As early as 1784 it occurred to him that steam might be rendered available for the propulsion of locomotive carriages. He immediately set about embodying his

idea; and, in 1786, submitted to the inspection of the professors and other scientific gentlemen in Edinburgh, the working model of a steam carriage, of which an engraving and description were given in the *Mechanics' Magazine* in October 1832. While the model was in Edinburgh, Patrick Miller, Esq., of Dalswinton, who had heard of it from Mr. James Taylor, tutor in his family, who had been a schoolfellow of Mr. Symington, minutely inspected it, and expressed himself highly pleased with its construction and performance. In the course of conversation, Mr. Miller mentioned that he had spent much time in making experiments for the propelling of vessels by wheels, in place of sails or oars; and that they had been put in motion by applying animal strength to turning a handle or winch. Mr. Symington on this observed that he thought a steam-engine might be constructed which would propel a vessel, by communicating a rotary motion to the paddles by the alternate action of two ratchet wheels, in the same manner as in the model of the steam carriage then before them. Mr. Miller said he considered such a thing impracticable; and inquired how it would be possible to work such an engine on board, without setting the vessel on fire. The description given of the model, and the manner in which it was intended to apply the power of steam, seemed to convince Mr. Miller of the practicability of the project, and he agreed that an

experiment should be made, on a small scale, as soon as Mr. Symington could attend to it.

"Soon after Mr. Symington accordingly constructed a small engine for the purpose, which was fitted on board a double-keeled vessel, lying upon a lake near the house of Dalswinton. With this vessel a trial was made, in the autumn of 1788, in presence of Mr. Miller and various persons of respectability, when the boat was propelled in a most satisfactory manner.

"In October 1789, a second exemplification of the practicability of this mode of propulsion, but on a much larger scale, was exhibited on the Forth and Clyde inland navigation, in presence of hundreds of spectators. The engine, which was four times larger than the former, was constructed at Carron Works, under the direction of Mr. Symington, and erected in a boat of Mr. Miller's which had been used on the canal in some previous experiments. Mr. Miller, Messrs. John Adam of Blairadam, John Balfour of Pilrig, Ambrose Tibbets, members of the Carron Company, James Taylor and David Drysdale, a seaman, who took charge of the helm, were on board. The boat glided along, propelled at the rate of nearly six miles an hour.

"After thus establishing the correctness of his views, Mr. Symington had the misfortune to lose the patronage of Mr. Miller for reasons which are variously related, but do not in any manner affect Mr. Symington's claims to the in-

vention in question. Mr. Symington's pecuniary resources being insufficient to enable him, unaided, to go farther in endeavouring to introduce steam navigation, he was compelled to desist, and turn his attention to other pursuits.

"After an interval of ten years, Lord Dundas applied to Mr. Symington, and having alluded to his former experiments, expressed a wish that he would construct a vessel capable of being propelled by steam, in dragging vessels upon the Forth and Clyde Canal, of which his lordship was an extensive proprietor. The vessel, called the 'Charlotte Dundas,' was accordingly constructed and fitted up with the requisite machinery under Mr. Symington's direction; and in March 1802, Mr. Symington took on board this vessel, at lock No. 20 of the canal, Lord Dundas, the Honourable Captain George Dundas, R.N., Archibald Spiers, Esq., of Elderslee, and several other gentlemen; and with two laden vessels (the 'Active' and 'Euphemia,' Gow and Esplin, masters), each of seventy tons burthen, attached to the steamboat, performed with great ease the voyage to Port Dundas, Glasgow, a distance of nineteen miles and a half, although it blew so strong a gale right ahead, during the whole course of the day, that no other vessel in the canal attempted to move to windward.

"In consequence of this complete verification of the utility of Mr. Symington's invention, a proposal was made to the proprietors of the

canal to substitute steamboats as tugs in lieu of horses ; but it was rejected, on the ground that the undulation created in the water, by means of the paddle-wheels, would wash down the banks, and occasion greater injury than any benefit likely to be conferred by the invention could counterbalance.

“Lord Dundas afterwards recommended Mr. Symington to the notice of the celebrated Duke of Bridgewater, in the hope that his Grace might be induced to adopt steam power upon the extensive canals of which he was the sole proprietor. Mr. Symington repaired to London for the purpose of having an interview with the Duke ; and on exhibiting to his Grace a model of his boat, and explaining its construction and capabilities, the Duke was so satisfied of the advantages to be gained, that he gave Mr. Symington an order to build forthwith eight boats on the same plan, for the use of his canal. Mr. Symington returned to Scotland, elated with the prospect of being able in a short time successfully to introduce steam navigation ; but almost immediately after he received tidings of the death of the Duke of Bridgewater, and the commission of course fell to the ground.

“Broken down in spirit by these successive disappointments, and unable to find elsewhere the patronage and assistance requisite for the prosecution of his schemes, Mr. Symington was doomed to see not only the splendid prize, which he thought secure within his

grasp, appropriated by others, but his claims to it denied and misrepresented. When a committee of the House of Commons was appointed, in 1824, to inquire into the nature of the engines employed on board of steamboats, Mr. James Walker kindly interested himself in behalf of Mr. Symington, and sent him notice that he thought it would be proper to get a memorial drawn up and laid before the committee. Before this, however, could be accomplished, Mr. Symington was informed that the investigation had terminated. He was induced, under these circumstances, to present a memorial to the Lords of his Majesty's Treasury, in consequence of which £100 were awarded from his Majesty's privy purse ; and a year or two afterwards a further sum of £50. He was in hopes an annual allowance might have been procured, but he was disappointed ; and all he ever received for the trouble he had taken to collect documents, furnish drawings, and defray his expenses, were the sums already noticed.

“After this disappointment Mr. Symington gave up all hope of having justice done to him. He died in London, at the house of his son-in-law, on the 22d March, 1831. The ‘ruling passion’ was strongly exhibited by him a few hours prior to and even at the moment of his death. The irregular form of his bedroom occasioned him so much uneasiness, that, when he became slightly delirious, he requested his son to reduce it to a proper square. And his last

act was an imitation of winding up and adjusting a newly invented chronometer, which he had nearly completed."

"Thus died," says Mr. Bowie, "an ingenious man ; one who, possessed of the highest talents, possessed not that knowledge of the world to enable him to guard against duplicity ; and who, when he found he had been taken advantage of, had too independent and indignant a spirit to trumpet forth his distresses, or proclaim his wrongs. It is a pleasing reflection that, although deserted by his country, he was never destitute of a home. Ill in body, and depressed in mind, he came to London in the hope of experiencing relief. Finding his health to improve, he resumed his mechanical pursuits ; and, until his disappointment by Government, seemed likely to have been spared, even for years. His mortal remains rest in the churchyard of St. Botolph, Aldgate-without : so that he owes not even a grave to the land of his nativity."

"The persons in whose behalf the claim of Mr. Symington to the introduction of steam navigation were contested were Mr. Taylor, Mr. Miller, Mr. Bell, and Mr. Fulton. The claims of these persons we may consider briefly in succession.

"*Mr. Taylor* left the grounds for his pretensions on record in a letter which he addressed to Sir Henry Parnell, the Chairman of the House of Commons' Committee on Steamboat Engines. He

states that it was he who suggested to Mr. Miller the application of steam power to the working of his paddle-wheels, a considerable time before he introduced Mr. Symington to Mr. Miller ; that 'being acquainted' with Mr. Symington, and knowing he had 'invented a new construction of the steam-engine,' a model of which he had seen at work, he asked him 'if he could undertake to apply his engine to Mr. Miller's vessels ;' that Symington 'answered in the affirmative, and from friendship he recommended both himself and engine, and afterwards introduced him to Mr. Miller ;' that 'after the classes of the college broke up,' he (Taylor) superintended the castings of the engine with which the first experiment on Dalswinton Lake was made, and took Symington with him 'to put the parts together ;' that in 1789, he 'repaired to Carron with Mr. Symington,' and 'constructed' (that is, he, Taylor, constructed) 'the engine employed in the second experiment, and that on returning to Dalswinton, and 'producing the account of the expense at Carron, Mr. Miller became irritated and disgusted at the conduct of the engineer, who had more than doubled both the time and expense unnecessarily,' 'swore he was a vain, extravagant fool, and did not care how much of his money he wasted, but he should never have that in his power again, for he would have nothing more to do with either him or his engine.' All which is, according to Mr. Taylor,

‘a true, faithful, and correct account of the origin and rise of the present system of steamboats.’

“The whole of this statement, it is important to observe, rests on Mr. Taylor’s own bare assertion. He had not the scrape of a pen to show in corroboration of his pretensions from Mr. Miller, though he continued on intimate terms with that gentleman to the period of his death, which was long after Symington had been publicly taken by the hand by Lord Dundas as the real author of steam navigation.

“*Mr. Miller’s* claim rests on his having suggested, in a Narrative of experiments on shipping, published by him in 1787, that steam might be employed for the purpose of turning paddle-wheels, and on the fact of the experimental trials on Dalswinton Lake and the Forth and Clyde Canal having been made by his direction and at his expense. Mr. Miller’s claim to originality is negatived by both Symington and Taylor. But although we cannot, therefore, concede to Mr. Miller the merit of having first conceived the idea of navigating vessels by steam, we cannot withhold from him the praise of having done more than any one other individual—Symington alone excepted—to bring the scheme into practical operation by the readiness and liberality with which he contributed the necessary funds for the purpose.

“*Mr. Bell.*—During the time the boat lay at Bainsford, Henry Bell, of Glasgow, was frequently beheld inspecting it; and, in 1811, he,

in conjunction with others, constructed the Comet steamboat, which in that year first plied upon the Clyde. With regard to Bell, it can be indisputably proved that he had numerous opportunities of witnessing the whole of Mr. Symington’s exemplifications from their commencement to their termination; and that he was at Carron Works, where he was often seen inspecting the machinery, even while it was being manufactured. Indeed to such an extent did he carry his curiosity, that the workmen used to complain to Mr. Symington of being unable to keep him out of the place where they were making the patterns. Much praise has been awarded to Bell for the introduction of steam navigation; but how far he deserves it the following facts will elucidate:—Notwithstanding the many opportunities he had enjoyed,—notwithstanding his having voyaged to America, to instruct or to be instructed by the celebrated Fulton,—the Comet was far inferior in her performance even to Mr. Symington’s second exemplification. When the Comet commenced her operations as a passage boat upon the Clyde, she possessed four insignificant paddle-wheels; and took nine hours to sail from Port Glasgow to Glasgow. The Elizabeth steamboat was the next constructed. Bell hinted his intention to prevent her being built; but his pretensions were too well known to induce the followers of his piracy to pay any attention to his threats; and he

soon had the mortification to see numerous and far more elegant vessels deprive him of the advantage at which his lawless cupidity had tempted him to grasp.

Although Mr. Fulton had undoubtedly the merit of introducing steam navigation on the waters of the western world, it is stated that he derived his first ideas of it, while in this country, from Mr. Symington :—

“It happened one day during the month of July 1801 or 1802, while Mr. Symington was conducting his experiments under the patronage of Lord Dundas, a stranger came to the banks of the canal and requested an interview : he announced himself as Mr. Fulton, a native of North America, to which country he intended to return in a few weeks ; but having heard of the steamboat experiments, he could not think of leaving Scotland without waiting upon Mr. Symington, in the hope of seeing the boat and machinery, and procuring some information as to the principles upon which it was moved : he remarked that however beneficial the invention might be to Great Britain, it would certainly be of more importance to North America, considering her many navigable rivers and lakes, and the ease with which timber could be procured for building such vessels and supplying them with fuel. He thought fit farther to say, that the usefulness of steam vessels in a mercantile point of view could not fail to attract the attention of

every observer ; and that if he was allowed to carry the plan to North America it could not but turn out to Mr. Symington’s advantage, as if inclined for it, or his other engagements would permit, the constructing, or at least the superintending the constructing, of such vessels, would naturally devolve upon him. Mr. Symington, in compliance with the stranger’s earnest request, caused the engine fire to be lighted up, and the machinery put in motion : several persons entered the boat, and along with Mr. Fulton, were carried from Lock No 16, where she then lay, about four miles west ; and returned to the place from whence they had started, in one hour and twenty minutes, to the astonishment of Mr. Fulton and the other gentlemen present. Mr. Fulton asked and obtained leave to take notes and sketches of the form, size, and construction of the boat and apparatus ; after fully satisfying his curiosity, he took his leave ; but he never afterwards had the honour or the gratitude to acknowledge his obligation to Mr. Symington.”

An effort of the muse, the work of a Mr. Muir of Kirkintilloch, was published in 1803, under the title of “The Steam Barge or Nautical Novelty ; written on seeing the New Steam Boat, invented by William Symington, pass through the Great Canal, dragging two vessels fully loaded.” The production is not of a high class, though some of its local Scotch expressions are

admirable. Its chief value is in the fact that the writer seemed to foresee developments of steam and steam navigation, some of which took half a century to evolve themselves, while others are still in the bosom of futurity :—

When first, by labour, Forth and Clyde
Were taught o'er Scotia's hills to ride,
In a canal deep, lang, and wide ;
Naeboddy thought
Sic wonders, without win' or tide,
Wad e'er be wrought.

To gar them trow that boats wad sail
Thro' fields o' corn or beds o' kail,
An' turn o'er glens their rudder tail
Like weather-cocks,
Was doctrine that wad needed bail
Wi' common folks.

They ca'd it nonsense, till at last
They saw boats travel east an' wast,
Wi' sails an' streamers at their mast ;
Syne, without jeeirn,
They were convinced the blusterin' blast
Was worth a hearin'.

For mony a year, wi little clatter,
An' naething said about the matter,
The horses harled them through the
water

Frae Forth to Clyde,
Or the reverse, wi' weary splatter
An' sweaty hide.

Then we believed, puir silly bodies
Wha naething ken o' learned studies,
That horses' hoofs and hempen woodies
'Boot still to draw them,
Wi' cursin callants clad in duddies,
To swear and ca' them.

But little think we what's in noddles
Whar science sits an' grapes and guddles,
Syne darklins forth frae drumly puddles
Brings things to view,
That the weak penetration fuddles
O' me an' you.

But lately we hae seen a lighter
Wi' in her tail a fanner's flighter,
May bid boat-haulers a' gae'dight her
Black sooty vent.
Than half-a-dozen horse she's wighter,
By ten per cent.

Wi' something that the learned ca' steam
That drives at heughs the waukin' beam
O huge engines to drain coal seam
Or carry hutches
She in her breast swalls sic a feam
As has few matches.

By it she through the water plashes,
An' out the stream ahint her splashes
At sic a rate, baith frogs and fishes
Are forced to scud
Like ducks an' drakes among the rushes
To shun the mud.

It was sae odd to see her pullin'
An' win' an' water baith unwillin' ;
Yet deil may care, she, onward swellin',
Defied them baith,
As constant as a mill that's fullin'
Gude English claith.

Can e'er, thought I, a flame o' reek
Or boilin' water's caudron smeeke
Tho' it was keepit for a week
Perform sic winners,
As quite surprise amaisht the feck
O' gazin' hunners !

But facts we canna weel dispute them ;
Altho' we little ken aboot them ;
When prejudice inclines to doubt them
Wi' a' her might,
Plain demonstration deep can root them
An' set us right.

Ere lang gae now, wi' whirligigs
An' steam engines we'll plough our riggs
An' gang aboot on lazy legs
Wi' nought to pain us,
An' flit in tethers useless naigs
That used to hain us.

Braw news indeed for man an' beast ;
They'll then hae nought to do but rest
An' on their former labours feast
Wi' cheerfu' heart,
When thus they see warm steam insist
To play their part.



CHAPTER II.

Her mighty engine wheels with splash and splutter
And power of hundred horses churn the ocean
(’Tis pity that such churning makes no butter) ;
On, on she sweeps with vibratory motion,
Much faster than a pleasure boat or cutter,
And yet for all her speed, I have a notion
She would not “walk the water” in high gales
So well as vessels fitted with good sails.

The Steam Boat.

PADDLE STEAMERS—THE FIRST AMERICAN STEAMER—THE “COMET”—
THE HULL AND ENGINE SIXTY YEARS AFTER—SPREAD OF STEAM
NAVIGATION—THE FIRST SEA-GOING STEAMER—FIRST ATTEMPT AT
DEEP-SEA STEAM NAVIGATION—PUBLIC ESTIMATE OF STEAMERS.

PADDLE STEAMERS.

THE steamers constructed by William Symington referred to in the preceding chapter were paddle-steamers, but their peculiarity was that the paddles were inside the vessel. Those in the original steamboat—as it is called—were situated fore and aft of the engine, working in a trough which extended from stem to stern, and allowed free egress and ingress to the water. The mode by which motion was given to the wheels was by the reciprocal action of a chain acting on ratchet wheels attached to the axle of the paddles; the stop ran over the teeth of the ratchet while the chain ran in one direction, but caught the wheel and moved the paddles in the return motion. A similar mode

of applying the motive power was used by Symington in the steam-carriage previously invented by him. In the later vessel named the ‘Charlotte Dundas’ the paddle-wheel was placed in the stern of the vessel working in a cavity open below and astern; and on this vessel motion was communicated direct from the piston to the wheel by means of a crank working horizontally. Thus, whatever modifications and improvements may have followed in later years, the principle on which the paddle steamer was moved was clearly shown in Symington’s second boat.

Up to the period of which we are now about to treat, the steamer meets us almost exclusively in

connection with the canal, and much that is stated in the immediately preceding chapter might have found a place in the earlier section of this work. We now, however, arrive at the time when the steam vessel aimed at something higher than the drudgery of dragging canal-barges,—however useful that occupation might be, and was preparing to take flight into the rivers and lesser seas preparatory to the subjugation of the ocean itself. For the history of the first step in this advance we have to cross the Atlantic.

THE FIRST AMERICAN STEAMER.

In March 1786, the Legislature of New York granted to a person of the name of Fitch, and to his descendants, the exclusive right of "making and employing and navigating all kinds of boats or water craft, which might be impelled through the water by force of fire or steam, in all the creeks, rivers, and bays, and waters whatsoever, within that State for fourteen years." Fitch never availing himself of this privilege, the New York Legislature, in 1798, repealed that act and granted the same privilege to Robert Livingstone, under certain restrictions as to the time he should accomplish his object. Nothing material, however, was effected until April 1803, when Robert Fulton joined with Livingstone. By successive acts the exclusive privilege was secured to these gentlemen for thirty years,

and between April and July 1808 they gave the required evidence "that they had constructed a steamboat of more than 20 tons propelled by steam more than four miles an hour against the stream of the Hudson, between New York and Albany." Thus, says an American writer, were twenty-two years expended in bringing to perfection this noblest of human inventions.

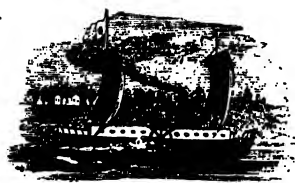
Mr. Fitch, who obtained the above powers from the State Legislature of New York, had in 1783 constructed a steamboat with paddle-wheels, on the river Delaware. For some reason which cannot be fully explained he failed in his efforts to realise what so soon after was accomplished; but he seems to have had a clear perception of the ultimate value of the invention when he prophesied that the time would come when steam-power would be employed in crossing the Atlantic.

We have already seen where Fulton obtained the ideas which enabled him to snatch the prize of victory from the hands of so many competitors who had nearly realised what he had the good fortune actually to accomplish. During his interview with Symington in the first years of the century, Fulton asked the former if he had any objections to his taking notes regarding the steamboat, which was answered in the negative, and he jotted down particularly everything that was then described to him.

Mr. Fulton also learned from

Symington the objection made to his vessel, on account of the narrowness of the canal, on which he observed that this objection would not apply to the wide rivers of America. It was two years after this, that experiments were made by Mr. Livingstone and Mr. Fulton on the Seine in France, and several years afterwards he ordered an engine to be constructed by Boulton and Watt, which should be applicable to a boat. This when finished was sent out to America, and was the first engine used with success for this purpose.

In August 1807, Fulton had the satisfaction of seeing this celebrated vessel moved by her



machinery from the birth-place to the Jersey shore. "Nothing," we read "could exceed the surprise and admiration of all who witnessed the experiment. The minds of the most incredulous were changed in a few minutes—before the boat had made the progress of a quarter of a mile the greatest unbeliever must have been converted. The man, who, while he looked on the expensive machine, thanked his stars that he had more wisdom than to waste his money on such idle schemes,

changed the expression of his features as the boat moved from the wharf and gained her speed; his complacent smile gradually stiffened into an expression of wonder—the jeers of the ignorant, who had neither sense nor feeling enough to repress their contemptuous ridicule and rude jokes, were silenced for the moment by a vulgar astonishment, which deprived them of the power of utterance, till the triumph of genius extorted from the incredulous multitude which crowded the shores shouts and acclamations of congratulations and applause."

This famed vessel, which was named the 'Clermont' (and is shown in the annexed woodcut), soon after sailed for Albany, and arrived without any accident. She excited the astonishment of the inhabitants of the shores of the river Hudson; many of whom had not even heard of an engine, much less of a steamboat. There were many descriptions of the effects of her first appearance upon the people of the banks of the river. Some of them were ridiculous, but some of them were of such a character as nothing but an object of real grandeur could have excited. She was described by some who had indistinctly seen her passing in the night, to those who had not had a view of her, as a monster moving on the waters, defying the winds and tide, and breathing flames and smoke. In Colden's Memoir we read that "the vessel had a most terrific appearance from other vessels which were

navigating the river, when she was making her passage. The first steamboat, as others yet do, uses dry pine wood for fuel, which sends forth a volume of ignited vapour many feet above the flue, and whenever the fire is stirred a galaxy of sparks flies off, and in the night has a very brilliant and beautiful appearance. This uncommon light first attracted the attention of the crews of other vessels. Notwithstanding the wind and tide were adverse to its approach, they saw with astonishment that it was rapidly coming towards them, and when it came so near so as that the noise of the machinery and paddles was heard, the crews (if what was said in the newspapers be true) in some instances shrunk beneath their decks from the terrific sight, and left their vessels to go on shore, while others prostrated themselves and besought Providence to protect them from the approaches of the horrible monster which was marching on the tides and lighting its path by the fires which it vomited."

In this first voyage the distance run was about one hundred and fifty miles, which was accomplished in thirty-two hours, giving a speed of about five miles an hour. The voyage back was made in the same time; and both going and returning the wind (a light breeze) being ahead, the whole was performed by the steam engine and wheels. The voyagers overtook many sloops and schooners beating to windward, and parted with

them as if they had been at anchor.

The 'Clermont' measured 138 feet long, with 18 feet beam, its depth was 7 feet and its burthen 60 tons; the paddle-wheels, which were outside, are stated to have measured 18 feet in diameter. Although its owner gave it the name of the 'Clermont,' it was popularly known at first as *Fulton's Folly*. The fact that the steamer made the voyage from New York to Albany against wind and tide soon enabled it to outlive that nickname, and for years it continued to carry large numbers of passengers. The public were, however, shy of risking the dangers of the fiery monster, and an interesting illustration of this in connection with the first voyage of the vessel was recently communicated to an American newspaper. A gentleman from New York happened to be in Albany at the time the 'Clermont' first arrived there. He found that the vessel was a general object of wonder, but that few people seemed willing to trust themselves to it as a means of conveyance. He, however, determined to sail down the Hudson to New York in this new steamer. He proceeded on board to secure his passage, and in the cabin he found a plain gentlemanly man, quite alone, and engaged in writing. This was Fulton, and the following dialogue took place.—

Stranger. Do you intend to return to New York with this boat?

Fulton. We mean to try to get back with her, sir.

Stran. Can I have a passage?

Ful. Yes, if you choose to take your chance with us.

Six dollars were then paid as the passage money. With his eye fixed on the money, which he retained in his open hand, Fulton remained so long motionless, that the stranger supposed he had miscounted the sum, and asked, 'Is that right, sir?' This roused the projector from his reverie, and as he looked up the big tear was brimming in his eye, and his voice faltered as he said—'Excuse me, sir, but memory was busy as I contemplated this, the first pecuniary reward I have ever received for all my exertions in adapting steam to navigation. I would gladly commemorate the occasion over a bottle of wine with you, but really I am too poor even for that just now, yet I trust we may meet again when this will not be so.' They did meet again four years afterwards: Fulton had not forgotten the incident, for few men ever forget the *first* fee received for their labour, and at the second meeting the wine was not spared.

The Americans are not slow to claim the priority in anything where success has crowned their efforts, and the following lines show in what light they viewed the position of Fulton as the father of steam navigation:—

Godfrey taught men to interrogate,
With steady gaze, tho' tempest-tost,
The sun,
And from his beam true oracle obtain.

Franklin, dread thunderbolts with daring hand,
Seized and averted their destructive stroke,
From the protected dwellings of mankind.
Fulton by flame compelled the angry sea
To vapour rarefied, his bark to drive
In triumph proud thro' the loud-sounding surge.

Between the period of Fulton's visit to Symington and the successful launch of the 'Clermont' several Yankee inventors appear to have been within an ace of robbing him of such credit as belongs to the man who first made a lengthy voyage on a steam vessel. John Stevens (or *Colonel* Stevens, as he preferred to be called) of Hoboken, who afterwards earned the reputation of making the first sea-voyage by steam—he having passed from the river Hudson to the river Delaware—constructed a boat twenty-five feet long, with boiler and engine of ingenious device. This was tried in May 1804, and had a velocity of four miles an hour. After having made repeated trials with her, Stevens' son undertook to cross from Hoboken to New York, when unfortunately, as the boat nearly reached the wharf, the steam-pipe gave way, having been put on with soft solder. This boiler being damaged, the next one was constructed with the tubes placed vertically. The engine was kept going for a fortnight or three weeks, the boat making excursions of two or three miles up and down the river; and for a short distance

the inventor could make it travel at a rate of not less than seven or eight miles an hour.

In the same year Oliver Evans, a rival projector, constructed for the Board of Health in Philadelphia a steam-dredger for cleaning the docks. Evans, who was a clever man with a plain name, considering that a sounding cognomen would do no harm to a simple machine, christened his mud-scaper the *Orukter Amphibolos*. It was a heavy flat-bottomed boat, thirty feet long and twelve feet broad, with a chain of buckets to bring up the mud, and hooks to clear away sticks, stones, and other obstacles. A small steam-engine was placed in the boat to work the buckets, having a cylinder five inches in diameter and a stroke of nineteen inches. "It was constructed one mile and a half from the river Schuylkill; the boat was mounted on wheels which were moved by the engine; the whole weighing about 42,000 pounds; and was moved with a gentle motion up Market Street in Philadelphia, and around the Centre Square; and Evans concluded from the experiment that the engine was able to rise any ascent allowed by law on turn-pike roads, which is not more than four degrees. When the *Orukter Amphibolos* was launched, he fixed a simple wheel at her stern to propel her through the water by the engine; she drew nineteen inches of water; and he inferred, that if the power had been applied to give the paddle-

wheel the proper motion, he could have stemmed the tide of the Delaware."

Evans declared that he had spent two thousand dollars on his project, while Stevens lamented that he "had been twenty years of his life on his, and had spent twenty thousand dollars, without deriving a shilling benefit." Stevens thought some of Evans' projects were absurd: to which the latter retorted "that the Colonel's setting himself up as an obstacle to his improvements had done more to perpetuate his (the colonel's) memory than his twenty years' hard work, and the loss of his twenty thousand dollars."

Dr. Nott, mentioned in a former chapter as the contriver of the "Three-Wheeled Chariot," was amongst the first to aid and supplement the labours of Fulton in his efforts to introduce steam navigation on the Hudson River, and the steamer 'Novelty,' which was largely constructed under Dr. Nott's guidance, came from New York to Albany "at a speed that astonished the age."

THE 'COMET.'

The name of Henry Bell of Helensburgh in Dumbartonshire, though coming four or five years after that of Fulton, is honoured as that of the father of steam navigation in Great Britain. Much of his fame, of course, he owes to Symington, whose experiments on the canal he had witnessed in 1789.

It is believed that Bell had, in 1799, completed a model of an engine for use on board a vessel, which did not meet the approval of those to whom he submitted it, but this opposition, instead of weakening, is said to have strengthened his enthusiasm. Possessed of an active mind, he is said to have crossed the Atlantic to America, where the system had been readily adopted. No longer uncertain of the result of his scheme, he, like a dutiful son, returned to his native country with the fruits of his adventure, and in 1811 the 'Comet' steamboat was constructed, with an engine of only four horse-power to navigate the Clyde between Helensburgh, Greenock, and Glasgow.

The 'Comet,' of which we give an engraving, was a very small steamer, being only 40 feet long, 10½ wide, and 25 tons burden. It was fitted with an engine of three horse-power, having a single cylinder, the piston acting on a crank which moved the paddle-wheels, and known as the "bell-crank" action. It was called the 'Comet' because it had been built about the time of the appearance of a comet in 1811.¹ Mr. Bell, its inventor and owner, who had been bred a house-carpenter, had taken a bath-house and hotel in Helensburgh, and thought it would be to his profit

to employ his steamer to bring visitors to and from Glasgow. In 1812 the 'Comet,' which had been built in the yard of John Wood and Company, Port-Glasgow, began to run regularly, and did so through the summer.

Notwithstanding the meritorious nature of his enterprise, the first year of Bell's speculation turned out to be a losing one; "for so great," says he, "was the prejudice against steamboat navigation, by the hue and cry raised by the fly boat and coach proprietors, that for the first six months very few would venture their precious lives in her. But in the course of the winter of 1812, as she had plied all the year, she began to gain credit; as passengers were carried twenty-four miles as quick as by the coaches, and at a third of the expense, besides being warm and comfortable. But even after all I was a great loser that year. In the second year I made her a jaunting boat all over the coasts of England, Scotland, and Ireland, to show the public the advantage of steamboat navigation over the other mode of sailing." With a pardonable vanity Mr. Bell exults in "having done (in Great Britain) what no king, prince, admiral, or general could do—made vessels go against both wind and tide, which had not before been accomplished in this country, so as to make them of any use to the public."

¹ Captain Bedford Pim, in his *Ship-building*, remarks on the coincidence, that at the same time a vessel was building in Ireland under the same name, and that the first steamer built for the British Navy was also called the 'Comet.'

Previously to the voyages of the 'Comet,' the average number of travellers between Greenock and

Glasgow was eighty up and eighty down ; in four years afterwards it was not unusual for five or six hundred passengers daily to enjoy the healthful amusement of a water excursion and the enchanting beauties of the Clyde. Regarding the origin, progress, and subsequent history of the 'Comet,' the following interesting particulars are given in Gillespie's *Glasgow and the Clyde*:—

"In 1811, Mr. Bell employed Mr. John Wood, shipbuilder, Port-Glasgow, to construct a small vessel ; and Mr. Robertson, who was then in business for himself in Dempster Street, Glasgow, having made an engine of three horse-power, sold it to his companion, and undertook to fit it into the boat with boiler and all necessary appliances. The price of the engine is given as £165, and of the boiler £27, and the date of the sale, April 1812. Shortly afterwards Mr. Robertson took the engine down to Mr. Wood's yard in a lighter, and found the vessel ready for launching. She was a neat well-shaped little craft, measuring 40 feet keel and 12 feet beam. She was gaily painted, and had the figure-head of a lady. Her cabin, which was very small, entered from the stern, down a few steps on each side. She had a mast, bowsprit, lug-sail, and four paddle-wheels. She was navigated by four adventurous men, viz. a master, an engineer, a pilot, and fireman. The name of her first captain was William M'Kenzie, who had been a schoolmaster in Helensburgh,

the engineer was Robert Robertson, the pilot was a Highlandman named Duncan M'Innes, but the fireman's name is lost to posterity.

"The 'Comet's' first voyage, under the care of these functionaries, was from Greenock to Glasgow, on Thursday, 6th August, 1812, when she arrived at the Broomielaw in three hours and a half. It was found, however, as Robertson had predicted, that the four paddle-wheels were unsuitable. She would not steer. Consequently two were taken off, after which she went to better purpose. The fares were 4s. first cabin, and 3s. second cabin. After a short time, Bell resolved to enlarge the 'Comet.' She was accordingly lengthened 20 feet. This operation took place on the beach at Helensburgh. The original engine was also displaced by one of six horse-power, made at Cartside, Greenock, by Thomas Hardie.

"So great became the success of the 'Comet,' that in 1819 we find her orbit widely extended. On September 2d in that year she was appointed to sail from Glasgow to Greenock, Gourock, Rothesay, Tarbert, Loch Gilp, Crinan, Easdale, Oban, Port Appin and Fort William, and on this station she continued to run, awaking, no doubt, profound astonishment in the Celt of the period, until October, 1820, when she was wrecked in the Dornist Mhor in an attempt to round the point of Craignish. Her weak engine-power was ill-fitted to contend with the rapid tidal currents which sweep and

eddy with amazing force through the 'big door.' The mishap would be accepted as a special interference of Divine Providence by the 'unco guid' of those days, many of whom had been prognosticating evil, and declaring it impious in Bell to attempt, as they said, against nature and God; or, to put the matter into the plain English used in our time, to drive a vessel against wind and tide. To keep up the name of the pioneer of steam navigation, a new 'Comet' was built by subscription in 1821 for the same route. After running safely for some years, 'Comet' the second came into collision with an Ayr steamer off Gourock on the 21st October 1825, and went down, with the loss, unhappily, of no fewer than 70 lives."

THE HULL AND ENGINE SIXTY YEARS AFTER.

The ultimate fate of the 'Comet' was striking. During the gales in February 1875, a vessel named the 'Anne' was sunk at Prince's Pier, Greenock. This vessel had been long known in the Irish trade from the Clyde, and probably few were aware of its historic interest. The hull was undoubtedly that of Henry Bell's 'Comet,' but it had seen many vicissitudes. It had been burnt to the water's edge, and its sides rebuilt. It had been lengthened amidships, and wholly altered in its character by that act, and in the dangers and troubles of a coasting vessel, it had no doubt

had many alterations and repairs. But as the Highlander's gun remained the same though supplied at various times with a new stock, a new lock, and a new barrel, so the coal sloop 'Anne' was the same ship in which Henry Bell had made his first essay on steam navigation.

An interesting relic of the 'Comet' is now preserved in the Corporation of Glasgow's Museum at Kelvingrove. This is the cylinder of the engine of the 'Comet,' which was presented to the Museum by Mr. McGeorge. The cylinder measures about 11 inches in diameter, and is about 20 inches deep; and affords a most striking example of the progress of marine engineering when it is compared with the cylinders of some of the compound engines made on the Clyde during the last few years. At the Lord Provost's banquet to the leading members of the British Association, at the 1876 meeting at Glasgow, this relic was presented to the citizens. Mr. McGeorge, in proposing the toast "The Memory of Henry Bell," made some interesting remarks upon the steamer 'Comet,' and stated that the cylinder of the engine fitted into that famous vessel had been presented to him some years ago by the widow of Henry Bell. The officials of the Patent Museum at South Kensington had expressed a strong desire to become possessed of it, but he had not acceded to the request, as he thought it ought to remain permanently in Glasgow. The gentle-

men present at the meeting expressed very great pleasure at seeing the relic of 1812 on the mantelpiece at the back of the Lord Provost's chair, and it will be admitted that Mr. M'George had chosen an auspicious occasion to present to the city this valuable and interesting relic.

SPREAD OF STEAM NAVIGATION.

The second vessel constructed on the Clyde was on the model of the 'Comet,' but she was a third larger and the engine had upwards of three times the power. But the 'Elizabeth' also differed from the 'Comet,' in being a profitable concern to her proprietor (Mr. Hutchison, a brewer) from the day she plied as a passage boat between Glasgow and Greenock. These two vessels having encountered all the vicissitudes of wind and weather incidental to a navigation of twenty-seven miles on a tidal river, in some parts four miles wide, inspired such deserved confidence in this kind of navigation that other individuals were led to the erection of larger and more commodious vessels to ply on the same route. After running two years on the Clyde, the 'Elizabeth' went to Liverpool. The third steamboat on the Clyde was intended to be an improvement on the common construction; Mr. Robertson Buchanan, an engineer, well known as a practical mechanic of the first order, made the paddles of the water wheels enter the water perpendicularly to its sur-

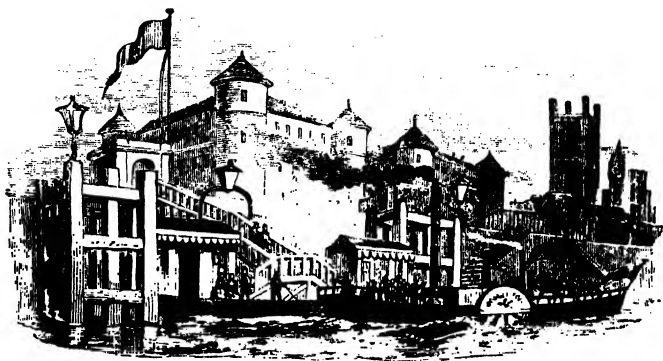
face, and rise from it nearly in the same manner, thus imitating what was considered to be the advantageous part of the action of a common oar. Buchanan was associated with two other wealthy citizens, both of whom had some experience in machinery; their operations excited much local interest, and their boat was called that of the "Three Wise Men." The mechanism was an ingenious one, but the friction from the eccentric movement, which produced the parallelism of the paddles, being enormous, the scheme was abandoned.

A vessel that attained to some distinction was the 'Industry,' which was launched at Fairlie in May 1814, and was constructed as a luggage boat to run between Glasgow and Greenock, in company with the 'Trusty,' built at Dumbarton and launched in February of the same year. The 'Industry' had engines, made by Dobbie of Tradeston, of ten horse-power. What rendered the 'Industry' remarkable was the fact that she continued to ply on the Clyde till about 1872, and was at that time known to be the "oldest steamer in the world." The fact that the hull of the 'Comet' was in existence as a sailing vessel did not interfere with the 'Industry's' special claim to record. To this succeeded the 'Margery,' a boat which, after running a short time between Glasgow and Greenock, was purchased for use on the river Thames, and, proceeding eastward by the Forth and Clyde Canal,

coasted cautiously southwards, being thus the first steamer to venture beyond a river's mouth in this country. She began to ply on the Thames on 23d January 1815, running from London to Gravesend, and in June of the same year she was sold to a French Company and taken over to the Seine, thus securing the honour of being the first steamboat to cross the English Channel. This we may assume to be the

vessel recorded as having been first put in motion in the canal near Limehouse, with the Lord Mayor on board, when she ran a mile and returned in sixteen minutes. From this it began to run for hire upon the Thames.

At first these boats had to contend not only with active and legal opposition by the Thames watermen, but with some scruples on the part of the public as regards danger from explosion ; and from



an article in the *Monthly Magazine* in 1817, we learn that attempts were made to quiet those fears. The writer, who had made a voyage from London to Margate for the purpose, says —

“The vessel left her moorings at the Tower about half-past eight in the morning, at the time when the tide was running strong up the river, and when no other vessel could make progress except in the direction of the tides. The steampacket, however, proceeded against

the stream in a gallant style, at the rate of six or seven miles an hour ; and a band of music playing lively airs on the deck combined with the steadiness of the motion to render the effect delightful.”

The writer proceeds to say with reference to the security of the boiler, which had only been tried with two and a half pounds to the square inch, that “there is therefore less danger in passing some hours in contact with such a machine, than there is in sitting

near a boiling tea-kettle, tea-urn, or saucepan, under circumstances in which they are often used."

As a commentary on this statement we may give the following record of what happened to a Thames steamer in the same year, as recorded in the *Scots Magazine* for August 1817:—

"The 'Regent' steam-packet sailed from London on Wednesday morning for Margate with about fifty persons on board, and about four in the afternoon she was discovered to be on fire, which was occasioned by the flue of the chimney being blown away, and the flame having caught hold of the wood-work erected upon deck for keeping the people near the chimney from burning themselves." The ship was run ashore, as appears to have been the usual remedy in such cases, and all were saved, but the whole vessel was destroyed, 'except the keel and engine, which on the ebbing of the tide were found buried in the sand."

The following is another early instance of danger from fire—the most appalling danger to which steam navigation is exposed:—

"The 'Robert Bruce' steam-packet, between Liverpool and Dublin, caught fire on the morning of the 28th August 1821, when about thirty miles from land, owing to want of attention to the boilers. Captain Carlyle immediately steered for land, and the crew and passengers employed every exertion to keep down the fire. Providentially, in about four hours

they succeeded in running her into the creek of Cemmies near Alnwick, where she was instantly scuttled and sank, after the passengers, twenty-four in number, and the crew, consisting of fourteen hands, and the luggage, etc., were all got safe on shore."

THE FIRST SEA-GOING STEAMER.

The impression amongst nautical men in the first days of steamers was against the notion that they could ever remain at sea in weather that could be braved by an ordinary sailing vessel. This point, which had not been decisively settled by the coasting or channel voyages of the 'Margery' was finally decided by Mr. George Dodd in September 1815. He is described as "a very resolute young man" formerly a naval officer, and was the designer of Waterloo Bridge, London. He went to Glasgow expressly for the purpose of fitting out a steamer for the sea and bringing her to London, and the story of this first voyage is so interesting that it deserves to be quoted in full. The vessel, originally the 'Argyle,' but altered to the 'Thames,' was about 90 feet long and $14\frac{1}{2}$ broad, with a burden of 75 tons; it had wheels of nine feet in diameter, and was driven by a side lever engine of fourteen horse-power. She was rigged with a square sail on the chimney-mast, a bowsprit sail, and another sail on the main mast; The crew comprised, besides Mr. Dodd, a mate, four able

seamen, an engineer, a furnaceman or stoker, and a ship's boy.

"The commencement of his voyage was not happy. The weather was very bad, and in the narrow channel which separated Scotland from Ireland the sea is sometimes terrible, by the rencontre of the ebb tide with the heavy swell which comes from the Atlantic Ocean. He was forced to seek shelter in Loch Ryan owing to the ignorance and presumption of the pilot, who, after the captain had retired to rest, altered the course he had been ordered to steer during the night, to gain the coast of Ireland by morning. At break of day the crew disturbed the captain to warn him of his danger; he immediately discovered that the wind had freshened to a heavy gale, attended with a heavy and irregular sea, and that instead of his vessel being on the coast of Ireland, she was within half a league of a lee rock-bound shore, two miles to the north of Portpatrick in Scotland. It blew too violent to attempt beating off this coast by sails and steam united; he therefore struck the little sail that was standing, and the main-mast constructed to lower, and depending entirely on the power of his engine, laid the vessel's head directly to windward, and ordered the log to be kept constantly going, which quickly ascertained that the vessel was clearing the coast, and going direct in the wind's eye at the rate of three knots and a half per hour. When he made a sufficient offing he bore away for

Loch Ryan, and soon came up with a brig in distress running for the same place, having carried away her main-topmast during the gale; a second attempt succeeded, and gained the coast of Ireland. No other power than that of steam would have impelled the vessel against that wind, and saved it from destruction.

"On leaving Dublin we left far behind us all the vessels that set forth with the same tide, and next morning, as we passed Wexford, the thick smoke which issued from the mast was observed from the heights near that city, and it was concluded that the vessel was on fire. At the instant all the pilots put to sea to fly to our assistance, and at the arrival of the first who reached us, it is impossible to describe the attitude of surprise mingled with disappointment which they evinced at beholding us in very good condition, and which frustrated their claim for salvage. While we were crossing St. George's Channel one of the paddle-blades, which was put out of order, was cut away with a steel chisel. Some hours afterwards, a similar accident happening to the other wheel, it was remedied in the same way. It was not perceivable that one paddle-blade less in each wheel produced any sensible effect in the progress of the vessel.

"At the entrance of the channel into St. Bridge's Bay, from the tide descending Ramsey channel in a straight and boisterous current and the tide rising on the other side in an opposite direction, the

waves were very high, and dashed against each other in all directions, and their turbulence, when we came into contact with them, was truly alarming; we often found ourselves so low between two waves that they hid the sight of the coast from us although it is very high; but the vessel made way over all these obstacles in the finest style. A small fleet of merchantmen quitted the pass and endeavoured to follow us, but in the passage of the bay above we outran them all hull down.

"On the other side of St. Bridge's Bay the pilot warned us of the danger there was in endeavouring to pass a straight passage called Jack Sound, except at high tide and with a good wind. 'There were' he said, 'a most rapid tide, and whirlpools which would seize the ship and carry it on rocks level with the water's edge. Captain Dodd, who knew the power of his wheels, insisted on going forward, which would save us probably another night at sea. The pilot re-urged his remonstrances, and trembled with fear, but we crossed all these whirlpools freely and without appearance of danger. Nothing however, was more frightful, than the appearance of these rocks, and the sea strikes against them in hollow waves that resound on every side. Our situation there at the beginning of night, in a vessel that had no other resource than the wind to get out, would have been very perilous, but our powerful and indefatigable wheels soon extricated us out of the danger

and brought us safe and sound into Milford Road.

"In approaching that place we met the king's packet-boat, with all sails spread to the wind, and had passed it about a quarter of a mile when the captain bethought him to transmit some letters by it; we put about and reached it in a few minutes and went round it, notwithstanding it continued under weigh; and after delivering our communications to the captain we went round it a second time and regained Milford Point.

"When anchored in the port of Hayle, a vessel which contained eleven persons with a party of pleasure, just at the mouth of the river, had been carried away by the tide and wind, and hurried on the rocks before any person perceived the danger. Captain Dodd discovered the vessel and its perilous situation; scarcely had he time to declare it when the calamity was at its height. This brave man, confident in his four rowers, boldly advanced amongst these rocks and breakers, and at the imminent risk of their lives succeeded in snatching from the waves four of the wretched individuals who had still signs of life. But notwithstanding the indefatigable cares of Captain Dodd, and of those persons to whom he dictated the means prescribed by the Humane Society, only two of them survived this sad event.

"In doubling the cape of Cornwall, the first of those two great promontories which terminate England on the west, a frightful

swell met us, with all the weight of the Atlantic, whilst the tide which running down St. George's Channel met those waves and raised them to a height which it appeared impossible to overcome, and equally dangerous to have in the rear if there were occasion to put about. The vessel appeared to suffer, and the repeated dashings against the case of the wheels alarmed the pilot, who heard them for the first time; night approached without any port offering itself to us. In this state of things Captain Dodd observed that the vessel sailed better before the waves than in any other direction; he, therefore, made a long tack close-hauled, so that we might get out of the latitude where the swell struggled against the tide. We spread some sails, which always contributed to the equilibrium of the vessel, and at the end of some hours we had doubled Land's End, when we found ourselves in a tranquil sea. After this there was nothing more in the voyage either laborious or remarkable; we were then at the entrance of the British Channel, which is said to be always more calm than the Irish Sea. The sun shone on us, the sea sparkled with its beams, and the coast unfolded its beauties—we beheld its woods, its villages, its rich cultivation. This interesting voyage, 758 nautic miles, was run in about 122 hours."

The next venture after the 'Thames' that deserves notice was the 'Tug,' a vessel built to tow

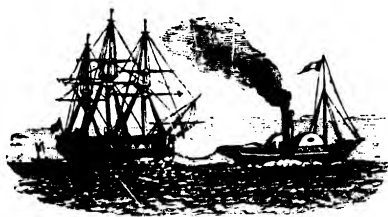
vessels from Leith to Grangemouth, and which, being too large to come by canal from Glasgow, rounded Pentland Firth. It is reported that, "although she encountered most boisterous weather off Cape Wrath and in the Murray Firth, she has arrived in perfect safety." She further ascended the Firth of Forth in a hard gale against wind and tide, "with a degree of velocity that astounded the numerous spectators."

FIRST ATTEMPT AT DEEP-SEA STEAM NAVIGATION.

The next steamer of individual note was the 'Rob Roy,' the first vessel designed and built by Mr. David Napier, one of the great foster-fathers of the art of steam navigation, and who, in the opinion of Mr. Scott Russell, did more for the improvement of that art than any other man. "In the history of Steam Navigation," says Mr. John Mayer in his article on engineering and shipbuilding, embraced in the volume on the *Leading Industries of Glasgow and the Clyde Valley*, issued on the visit of the British Association to Glasgow in 1876, "David Napier must ever rank as a man of very great mark. He was the first person who seriously set about the practical adaptation of the steam vessel for deep-sea traffic, his first effort being the establishment of direct and regular communication by steam between Greenock and Belfast; and in order to enable him to form a

correct notion of the kind of vessel that would be required for that station, and the power of the engines necessary to propel it even in the stormiest weather, he took passage at the worst season of the year in one of the sailing vessels which then plied between Glasgow and Belfast, and which often required a week to perform a journey that is now done by steam in nine hours. After anxiously watching the effect of the waves when the vessel was tossed in a storm, and satisfying

himself that there was no insuperable difficulty, he retired contentedly to his cabin, leaving the captain not a little puzzled at the strange curiosity shown by his passenger regarding the effect of rough weather. He at once saw the end of his difficulties, and soon satisfied himself as to the best means of overcoming them. He subsequently tried experiments upon the best form of hull for getting through the water with the minimum of resistance; and these led him to adopt a fine



wedge-like form for the fore part of his vessel, instead of the round full bow then common in those propelled by sails.

"Having got a steamer built according to his notions by Mr. William Denny of Dumbarton, which he called the 'Rob Roy,' a vessel of about 90 tons burden, and into which he himself put engines of 30 horse-power, he started her on the Greenock and Belfast route, on which she plied successfully and with perfect regularity for two winters, after which she was transferred to the English Channel to serve as a packet between Dover and Calais.

Thus began the important service which David Napier rendered to steam navigation. He was not slow to extend the dominion he had thus acquired over the open sea. In the year 1819 he employed Messrs. John Wood and Co. to build the 'Talbot,' a vessel of 150 tons burden, into which he fitted two engines of 30 horse-power each. The 'Talbot' was by far the most perfect vessel of her day in all respects, and formed a model which was long in being surpassed. She plied between Holyhead and Dublin, and was the means of conferring on Ireland the advantage of a direct, certain, and rapid

communication with England. She was soon succeeded, on the same line, by another excellent vessel, the 'Ivanhoe,' built by Mr. Scott of Greenock, having a carrying capacity of 170 tons, and fitted with Mr. Napier's engines of 60 horse-power in the aggregate. For a long time she continued the best packet between Holyhead and Dublin, on which station, in the year 1821, there were four steamers, including the two just referred to ; and although at first they were merely intended as auxiliaries to the sailing packets, they very soon superseded them entirely. So far back as 1822, now fully half a century ago, the mail service was reduced almost to a certainty ; for whereas exactly 100 Irish mails arrived in London late in the year prior to the adoption of the steamers, there were only twenty-two cases of delay in the first nine months during which the steam packets were used, although this period included the winter season, during the early part of which the weather was worse than it had been known for more than sixty years.

"It was Mr. David Napier, likewise, who established the first line of commercial steamships between Liverpool, Greenock, and Glasgow, a station which has ever since been famous for the size and power of the steamers placed upon it, as also for their magnificent accommodation and the rapidity with which they have all along accomplished their voyages.

The vessels placed upon this line were three in number, namely, the 'Robert Bruce,' of 150 tons, built by Messrs. Wood of Port-Glasgow ; the 'Superb,' 240 tons, built by Mr. Scott of Greenock ; and the 'Eclipse,' of 140 tons burden, built by Mr. Robert Steele, also of Greenock. Their engines were all supplied by Mr. Napier himself, and were respectively of 60, 70, and 60 horse-power. All these vessels were established as deep-sea traders under the direction of Mr. Napier before the year 1822 ; and thus within a period of about three years, through the abilities and energy of that distinguished pioneer of the new art of steam navigation, it had received in the Clyde an extension and perfection that rendered it an object of great national importance."

The 'Roy Roy,' as we read in the *Scots Magazine* for 1818, returned from her first voyage in safety ; although in crossing the channel she experienced a most severe storm, so much so that some of the passengers proceeded by land from Carrickfergus. To their astonishment they there met the 'Rob Roy,' she having reached the port six hours before them.

The progress of steamboat-building in the next two years was rapid. Referring to the above-mentioned steamer and her successor, *Blackwood's Magazine* of 1825 says—"In 1818 the 'Rob Roy,' of ninety tons, built upon a new principle by Mr. Denny of Dumbarton, furnished with an engine of 30 horse-power made by Mr.

Napier of Glasgow, first passed the bounds formerly prescribed by inexperience [this, as we have just seen, was not quite accurate], and at once astonished and delighted the world by affording a safe and economical mode of conveyance between Greenock and Belfast, a distance of about one hundred and twenty miles. In the following year (1819) the 'Talbot,' of still greater dimensions and with a higher steam-power, began to ply between Dublin and Holyhead, and in the outset successfully encountered many severe gales. The spirit of enterprise for this navigation now began to burst forth with increased energy, particularly on the banks of the Clyde. The 'Ivanhoe,' 'Belfast,' 'Robert Bruce,' 'Waterloo,' 'Eclipse,' 'Superb,' 'Majestic,' and 'Cambria,' were all constructed on a scale of larger dimensions and with engines of greater power than heretofore, calculated to sail from the Clyde to the distant ports of Greenock, Belfast, and Liverpool. The 'City of Edinburgh,' on a scale of still greater magnificence and grandeur, was also launched this year, and her track of navigation first proved the practicability of making a safe and expeditious passage by steam upon the high seas between the ports of London and Leith, a distance of over 400 miles. . . In the same year the steam-packet 'Tourist' (then under command of the writer of this article) in out-running the mail coach by ten hours in the distance between London and Edinburgh, induced

government to adopt a quicker despatch for the mail upon that road. During the following year (1820) the 'James Watt,' a vessel highly creditable to the talents of her *engineer* and to the liberality which has always marked the patriotic proceedings of the Leith and London Joint-Stock Company, was built. The 'St. Patrick' and 'St. George' of Liverpool were also soon afterwards built upon a similar scale of grandeur, under the able superintendence of Mr. William Laird. The 'Swift' of Leith, formerly a sailing smack, was at this time fitted up as a steam-packet, and first opened the passage between Brighton and Dieppe in France; then came the 'Lord Melville' and 'Talbot' between London and Rotterdam. Ferry-boats propelled by steam and suited more immediately to local situations were established about this time upon the Mersey, Tay, Forth, Severn, Humber, and other navigable rivers and arms of the sea." In 1820 there were in England 17 steam vessels, in Scotland 14, and in Ireland 3. In America the progress of the new system of navigation would appear to have been much more rapid, as it is stated that in 1821 there were in that country 300 steam vessels in full operation, while a large number were building.

PUBLIC ESTIMATE OF STEAMERS.

"Are they too sanguine who see in steam powers further de-

velopment, a great revolution in naval tactics—in the attack and defence of kingdoms—in the importance of ancient maritime stations—in the increased energy given to internal improvement, in its international effects, uniting countries and places which Nature had disjoined, and which natural causes would for ever have acted to continue the separation; ‘gathering in, as it were, the nations in harmony with each other, in love, and unity, and peace and concord?’ Already a power, probably equal to a sixth part of all the steam-engines in being, is appropriated to propelling vessels. At the end of 1823, there had been ninety steamboats *built in Scotland*, the cost of which, averaging about four thousand pounds each, will give an amount of three hundred and eighty thousand pounds of sunk capital; of that number forty-five were sold from the Clyde. In the year previous to this (1828) *fifty-five steam vessels were plying in Scotland*, thirty-two of them belonging to the Clyde: supposing these fifty-five vessels to employ five hundred and fifty men and officers, their yearly wages will amount to thirty-two thousand pounds; the coals consumed to thirty-two thousand; harbour dues six thousand five hundred pounds; tear and wear on all boats, twenty-two thousand pounds; profit on capital invested, at ten per cent; altogether, this is an annual disbursement, which proves the receipt of one hundred and four-

teen thousand pounds per annum for the fare of passengers on the rivers of Scotland; and if we only estimate each passenger to pay four shillings, this will give nearly *six hundred thousand persons*, who, in one year, have availed themselves of the convenience of a steamboat.”

Although the statistics in the above extract from Stuart's *Anecdotes of Steam Navigation* appear trifling in view of the enormous subsequent development of steam navigation, and that more particularly within the last ten or twelve years, the words themselves show that the possibilities of steam-vessels were early foreseen by those who had studied their progress with any degree of intelligence. It is not our purpose at this point to dwell on the national or international advantages, in a commercial sense, which the power of defying the winds by means of steam has placed in our hands, but to notice a few of the social changes which the introduction of the steamboat helped to effect in its earlier years, leaving to a subsequent chapter some notice of the pleasures and dangers of the steamer in our own day.

The first point to which attention was directed was, undoubtedly, that of speed, and next that of comfort. To those who dreaded not the terrible *mal de mer*, there was great attraction in a mode of travelling which was not only quite as speedy as the most rapid mail coach, but presented the novelty of giving board and lodge-

ing—a floating hotel—at the same time. True, the ordinary “London Smack” would do this also, in a manner, but the improved accommodation of the steamboat was not less remarkable than the freedom from those vexatious delays which sometimes made a voyage from Leith or Hull to London an affair of as many weeks as the first steamers occupied days. Of an early Leith and London steamer, we find the following contemporary notices :—

On 16th February 1821, the ‘Mountaineer’ was launched at Leith, the length of keel being 104 feet, and its engines two, of 40 horse-power each. “The ship,” says the *Scots Magazine*, “promises to be a great accommodation to travellers between the capitals of the two kingdoms, as it is expected, from the fine form of the vessel and the immense power of the engines, that the passage will be accomplished, on an average, in the short space of 60 hours.”

Four guineas and a half the cabin fare.

.
With roasted, boiled, and baked, I know
not where
Thou couldst fare better, save in an
hotel.
But men of moderate incomes it don’t
suit
To pay maids, waiters, and somewhat
to boot.”

To those who are familiar with the present speed and the present fare of the Leith and London boats, the above rate and the price quoted

will not appear in any way remarkable. As regards the charges, the price quoted in the verses included the cost of living on board; in other words, it covered hotel expenses for two days and a half. The introduction of railways instantly reduced the fare to a much lower figure, and on some occasions the spirit of competition has been so much excited that the cost of travelling that voyage of 450 miles has been made almost nominal. No competition in price, however, could have enabled a steam vessel to compete with the railway at all, if the speed of fifty years ago had not been exceeded. And there is no more striking evidence of the vast reform which recent years have witnessed in the build and equipment of steam vessels than the fact that a voyage which was thought speedy at sixty hours in the infancy of the system, is now thought to be unduly prolonged if the time from quay to quay much exceeds thirty hours. Rapidity, such as it was, was the leading feature of the new method of travelling which impressed itself on the public mind in the infancy of steam. “The steamboats on the Clyde go at the rate of seven or eight miles an hour, which is as rapid sailing as any one would desire or choose,” says a writer in 1817, while a year or two later we cull from the same source the following instance of what was thought marvellous celerity of movement :—

“A gentleman who left Belfast

on the 14th June 1821, reached Glasgow the same evening, embarked on board the 'Tourist' at Newhaven on Friday morning, and arrived at Aberdeen at nine o'clock that night." "Had such an event been predicted fifty years ago," continues the writer, "it would have been nearly as easy to make people believe that this journey could have been accomplished by means of a balloon."

Of course there were growls of opposition to the steamer, some of which, such as the danger from fire, have been already referred to. But the good old Tory, *Blackwood's Magazine*, only echoed an ancient idea when it permitted one of its contributors to write thus of the new contrivance :—

"Well, then—shall we content ourselves with a Steam-boat? With that Fairy Floating Palace, the 'United Kingdom'? No. The sound of her enginery is like that of a horse whose wind is broken, or the Director-General's haggis, that was a roarer. Give us one of the coursers of the good old English breed, that trace their descent from the reign of Alfred, and that have braved for a thousand years the battle and the breeze. What though she must obey the blast—it is like a servant not a slave. Gloriously she carries her motion, even by a side-wind; and when Eolus and Neptune clear the course, hurra! to the foaming thunder that rolls away from before her triumphant

prows! In the blue sky how beautiful her cloud of sail! Nor desire we any meteors than her streaming flags. No smoke accompanies her walk upon the waters, unless when she rejoices, in peace or in war, saluting the star of some 'tall admiral,' or commanding the foe of the Isle to haul down its country's ensign, and fall under the dominion of her wake."

In *Reginald Dalton*, a work from the pen of a contributor to *Blackwood*, we have the following "counterblast" against the steam vessel, holding up against it the delight of stage-coach travelling :—

"It was, after all, a stupid notion of Mr. Galt's to write a book about a steamboat. A steamboat has all the disadvantages of a hoy or smack—I mean, all its discomforts—and it has a thousand new ones of its own. Its inflexible pertinacity, its always sticking to the proper point of the compass, its main chance, is disgusting; the clack of the oily machinery is monotonous as Rogers; if you go away from the mast chimney you shiver, and if you stand near it, your clothes are seethed about your body, from the escape valves. Smoking is forbidden upon deck—a piece of tyranny as indefensible as would be that of preventing a boy from setting off his squib in the neighbourhood of an ordnance review; and down below, if you are not sick yourself, you are surrounded with frowsy old women, ugly old men afraid of open

windows ; squalling, sprawling, children ; Cockney tourists with red morocco memorandum books ; noblemen's servants passing themselves off for gentlemen at large ; squeamish girls going to the boarding school ; pleasuring shop-keepers, sentimental conveyancers, and sulky M.P.'s. Such a mode of existence is destructive of individual comfort, and the mortal enemy of all social intercourse. The dishes are greasy, the spoons are pewter, the table-cloth is dowlax, the beer vapid, the port black poison, and the motion a weariness of the flesh. What are swiftness and cheapness to set against such a conglomeration of bores ? Had the ancients foreseen Watt and Boulton, old Charon would certainly have had a steam-boat for his *σκαφίδιον*. Nothing is more delightful, on the other hand, than a journey in a stage coach. Comfortable cushions prop your back and your sides ; the world is whirled along in your view, like a perpetual panorama ; your friend sits opposite to you as comfortable as yourself, and you may have a paper of sandwiches and a bottle of sherry, usquebaugh, curaçoa, anything you like, at your elbow if you have a mind. A thousand continual little varieties are continually occurring. If the chatty old lady leaves you, the blooming damsel takes her place the next stage. There is always some one to laugh with or at ; and in spite of all that has been said by the Laurette Espriella and other superfine Dons, you have excellent

meals three times a day, and snowy sheets every night."

A French journalist from whom some sentences have been quoted in earlier chapters of this volume, joins *Blackwood* in the dispraise of the steamer from an æsthetic point of view. Of course a Parisian journalist is nothing if not cynical, and in juxtaposition to his growl at the hideousness of the steamer may fairly be placed the opinion quoted in a subsequent page, where the enjoyment of rapid progress in a river steamer caused him to forget for the moment the duty of being smart and sarcastic :—

"Civilisation has its attractive points, but all that it produces is disfigured by ugliness, and thus betrays its complicated and diabolical origin. Compared to a sailing vessel, a steamer, however convenient it may be, appears hideous. The former looks like a swan spreading its white wings to the gentle breeze, while the latter resembles a stove running away as fast as it can on the back of a water mill." This comparison seems to be the parent of the story from the north-west Highlands when the Dingwall and Skye railway was opened, "Eh, mother, I saw a smiddy rinnin awa wi' a lot o' houses !"

A curious testimony to the possible *désagréments* of a steamer was borne by Professor Huxley when, at the dinner at Edinburgh in July 1876 to celebrate the return of Sir Wyville Thomson and the exploring ship 'Challenger,' he dilated on

the power for good or evil, for comfort or discomfort, which the captain of a steamer—the “bishop” as he calls him—may exercise:—

“I do not know by what peculiarity of human nature it is, but assuredly when a quantity of men are shut up together on board ship, charity and love do not commonly enter there. I assure you—I do not suppose that I am a worse-conditioned man than most—but I assure you I have hated a man because of his peculiar sneeze. The reason is that, if you hear that sneeze or that laugh for three months together, you can readily understand why I should hate him. When men are shut up together in a limited society, whether it is a cathedral city or a ship, they began to hate one another, unless the bishop is a very wise person. And I have no doubt that in this case the bishop was a very nice person.”

COMFORT OF THE STEAM VESSEL.

The personal comfort and enjoyment of travelling in a steamboat—always of course barring sea-sickness, under which travelling in no vessel can be comfortable or enjoyable—were early recognised, despite the enthusiasm of such as *Ebony* for the “good old times.” One facility which the early patrons seemed specially to enjoy—at least it is frequently mentioned in the current literature of the period—was the opportunity of reading which the new and improved system of travelling

afforded. Here we may set one *Blackwood* contributor against another, in an extract from the *Ayrshire Legatees* of John Galt, in which casual reference is made to this point:—

“On the following day morning, by the break of day, we took shipping in the steamboat for Glasgow. I had misgivings about the engine, which is really a thing of great docility, but, saving my concern for the boiler, we all found the place tolerably comfortable. The day was bleak and cold, but we had a Carron grate in the middle of the floor, and books to read, so that both body and mind are therein provided for.”

And a rhymester from whom we have already quoted has several references to the same point:—

If smack to London thou would'st wish
to go,

Then, gentle reader, go not in a
smack,

Because accommodation's but so so ;

And if the wind's not fair she can but
tack,

And if (as sometimes does) it comes to
blow

Long sickness makes thee wish that
thou wert back ;

So taking all things into view, I deem

My best and wisest plan's to go by
steam.

Her library has standard works—with
most

Of Campbell, Byron, Scott, the
mighty three ;

I sing of steam,
Our bark glides swiftly with or without
wind ;

On a calm sea, while other vessels
seem

Like sleeping turtles lingering far behind,

She rushes onwards with unslackened speed,
And passengers who will not sleep must read. .

In the course of his celebrated letters on "Locking in on Railways," Sydney Smith has an incidental reference to the freedom of travelling in a steamer, when he remarks that in packets landmen are not locked into the cabin to prevent them from tumbling overboard. "The power of devouring space," says Theophile Gautier, "with the rapidity of an arrow, and that too without any trouble, fatigue, or jolting," while you quietly pace the deck and see the long lines of the shore glide past you, in defiance of the caprices of wind and tide, is certainly one of the finest inventions of the human mind." In a later chapter we shall have something to say as to the attractions of travelling in the larger ocean steamers, and we may conclude our references to the earlier and less venturesome steamers by a comparison between the advantages of a sailing vessel and a steamer, from the seaman's point of view, which the popular American author, Sam Slick (Judge Halliburton) puts into the mouth of a prominent character in his *Nature and Human Nature*:—

"In a sailing vessel all your work is on deck, everything is before you, and everybody under your command. One glance of a seaman's eye is sufficient to detect if anything is amiss, and no man is

indispensable to you. In a steamer the work is all below, the machinery is out of your sight, complicated, and one part dependent on another. If it gets out of order you are brought up with a round turn, all standing, and often in a critical situation too. You can't repair damage easily; sometimes can't repair at all. Whereas carrying away a sail, a spar, a topmast, or anything of that kind impedes, but don't stop you, and if it is anything very serious there are a thousand ways of making a temporary rig that will answer till you make a port. . . . Clippers of the right lines, size, and build, well found, manned, and commanded, will make nearly as good work, in ordinary times, as steamers."

While the revival of stage-coaching shows that the railway system, with all its advantages, has not supplied all that may be expected in regard to the *pleasure* of travelling—the chief pleasure in railway travelling being, in short, its speedy termination—so the amount of patronage bestowed on river and coasting steamers, even between places where the train service is full and rapid, shows that the personal ease, the freedom of motion, the opportunity for study, and the fine fresh air afforded on board a steamer, have lost none of their attractiveness to those who seek to combine enjoyment with progress in their journey.



CHAPTER III.

The ebbs of tides, and their mysterious flow
We, as art's elements, shall understand,
And as by line upon the ocean go
Whose paths shall be familiar as the land.

Instructed ships shall sail to quick commerce
By which remotest regions are allied
Which makes one city of the universe,
Where some may gain, and all may be supplied.

Then we upon our globe's last verge shall go,
And view the ocean leaning on the sky ;
From thence our rolling neighbours we shall know
And on the lunar world securely pry.

DRYDEN.—*Annus Mirabilis*, 1666.

OCEAN STEAMERS—THE FIRST ATLANTIC STEAMER—THE 'GREAT WESTERN' AND 'SIRIUS'—THE 'GREAT BRITAIN'—EXPERIMENTS IN FORM AND SIZE—THE 'GREAT EASTERN'—GENERAL PROGRESS OF STEAM NAVIGATION—IRON-CLAD WAR-STEAMERS—FIRST IRON BOAT AT SEA—STEAMERS IN COMMERCE—THE OVERLAND ROUTE—THE ROYAL MAIL STEAM PACKET COMPANY—THE CUNARD COMPANY—SPEED AND ROUTE ON THE ATLANTIC—CHANGES IN FORM OF MARINE ENGINES—SAVING IN FUEL.

OCEAN STEAMERS.

WHEN Dryden wrote the lines above quoted, beginning his next stanza with the words "This I foretell," steam navigation was an unknown art, though several very ingenious essays in that direction are recorded at dates far anterior to the middle of the seventeenth century. And there was nothing promising in the science of navigation without steam, in Dryden's time, to give foundation for the poet's daring speculation. The last stanza need not be taken as an expression of Dryden's belief in the old fgment that the earth was a vast plain, over the "last verge" of which some daring adventurer might some day peep, and securely pry into the lunar world. But he foresaw that in time the paths of ocean should be familiar as the land ; and, placing no limit on the surprises the world might have in store for adventurous navigators,

he took the poetical license of picturing even lunar discovery as within the range of possibility.

In the last chapter we have seen the beginning of steam navigation at sea, and so far traced the progress of the steamboat in its career as a national means of communication. In the development of international commerce, steamers have held such a distinguished place, that it is not too much to say that to ocean steam navigation is owing much of the world's progress in recent years, and that we have in many respects realised Dryden's dream of a time when "instructed ships" should "make one city of the universe."

As in most other things, the title of the "first ocean steamer" is a disputed one. The 'Great Western' is generally credited with having been the first to cross the Atlantic, but there are several competitors for this title. It will probably be conceded that she was really the first successful commercial venture in the shape of a steam vessel plying between two distant countries, but that she was preceded in the act of steaming across the Atlantic is undisputed.

THE FIRST ATLANTIC STEAMER.

The first recorded voyage over the Atlantic was in 1818—in the early youth of steam vessels—when a ship called the 'Curaçoa' is stated to have made the voyage from Helvoetsluys in Holland to Surinam and Curaçoa, occupying thirty-two days on the voyage, in

eleven of which she was under steam. This vessel was of 400 tons burden, and her engines are stated to have been of 100 horsepower.

A year later a voyage from the other side was made by the 'Savannah,' a vessel impelled by steam and of 315 tons burden, which arrived at Liverpool on Sunday, 20th June 1819, from Savannah in Georgia, after a voyage of twenty-five days. The want of fuel protracted the voyage to that length, as it was calculated, on her departure, that she would make the passage across the Atlantic in fifteen days. Several days before her arrival the 'Kite,' revenue cutter, on the Cork station, chased the 'Savannah' a whole day, going ten knots, supposing her to be a ship on fire, when at length perceiving the 'Kite' in chase, the captain of the steamer stopped her engine till the latter came up.

A period of fourteen years elapsed before the Atlantic was again crossed by a steamer, the next of which a record can be traced being the 'Royal William' in 1833. At the British Association meeting for 1875, Sir John Hawkshaw, in his presidential address, referred to the 'Great Western' as the first vessel—repeating the general conviction referred to, and doubtless speaking thus of the vessel in the character we have assigned to her, as the first successful attempt to organise Atlantic steaming on a commercial basis. The reference to the 'Great

Western' however, drew forth the following highly interesting letter, signed "A. Macdonald," addressed to the editor of the *Times* :—

"Sir John Hawkshaw, in his address before the British Association, falls into a common and hitherto uncorrected error respecting the first steamship which crossed the Atlantic. Five years before the 'Sirius' and 'Great Western' made their successful attempts to do this, the steamship 'Royal William' sailed from Quebec on the 18th of August 1833, and after two or three days' detention at Pictou, Nova Scotia, arrived at Gravesend on the 11th of September, thus making the trip in about the same time as that taken by the first Cunard boats to Boston. The 'Royal William' was built at Three Rivers, and fitted at the St. Mary's Foundry, Montreal, with engines made in Britain. So far as my boyish recollection of the vessel serves me, I think she was about 500 tons burden. I remember very well her departure for Britain, but in order to be sure I called at Lloyd's some weeks ago, and was courteously shown the register for Sept. 12th, 1833, in which I found, under 'Gravesend,' the announcement of arrivals on the 11th, the following :—'Steamship 'Royal William,' M'Dougall, Quebec.'

"Several years before a vessel called the 'Savannah,' fitted with an engine and paddles, crossed from Savannah in thirty-one days. The paddles were removable. Her engines were only used eighteen

days. When the 'Savannah' entered the Channel off the coast of Ireland, the smoke from her funnel brought down upon her a gun brig detached from the Channel Squadron, under the impression that she was a ship on fire. The 'Savannah' was a full-rigged ship, and although she advertised her sailing and for passengers, no one was brave enough to ship aboard of her. As the 'Savannah' was not a steamship, but merely a sailing vessel, with a temporary arrangement for steaming on board, to the Canadian 'Royal William' must be accorded the honour of being the pioneer of our present large Atlantic steam fleet. What became of this vessel subsequently I am uncertain, but have the impression that she was sold to the Portuguese Government."

Besides the claim of the 'Royal William' to be the first Atlantic steamer (exclusive of course of the 'Savannah'), proof is furnished by an entry in Gore's *Directory* (for Liverpool) that she was also the pioneer Atlantic steamer from that port. Under 1838 we find the following :—

"The steamer 'Royal William,' 617 tons burden and 276 horsepower, sailed from this port for New York, with passengers only, July 5, and returned August 19. Her outward passage was performed in 19 days, and her homeward in 14½. *This vessel has the honour of being the first steamer from this port to cross the Atlantic.*"

While Holland, Canada, and

Georgia, thus seem to dispute with Britain for the first actual Atlantic steam-voyage, the records show that France furnished the first voyage of the kind to Africa. In 1820 we read that a steam-brig called 'Le Voyageur,' which sailed from l'Orient for Senegal on the 18th of October in that year, arrived safely at the place of its destination, after a voyage of sixteen days. "This is the first steam vessel that sailed from a French port on a voyage of any length."

Five years later, a yacht called the 'Falcon' with auxiliary steam-power made the voyage to India. She was followed in the same year by the 'Enterprise,' of 470 tons and 120 horse-power, which sailed from the Thames for India. She left on 1st August, leaving Falmouth on the 16th, and expecting to make the voyage in eleven weeks. The papers of the date do not tell what passengers she carried or where she was to touch for fuel, but we learn that the voyage was completed on 9th December, or six weeks longer than the time expected. The possibility of its being accomplished in three months was questioned at the time, the distance to Calcutta being 14,500 miles, and this required an average rate of 200 miles a day. As the consumpt of coal was very different then from what has been the standard of late years, there was some ingenuity in the reminder of one chronicler of the period that "the quantity of coal

which would carry a vessel 1000 miles at ten miles an hour would carry her 2000 miles at half the speed, because to produce double the rate of motion requires four times the quantity of coal."

THE 'GREAT WESTERN' AND 'SIRIUS.'

It is a remarkable fact that such calculations as were made in this case—used too as a reason for prophesying non-success—were also advanced against the practicability of crossing the Atlantic by steam. In the address to the British Association already referred to, Sir John Hawkshaw recalled the facts of the opposition to steamships, and of their subsequent development, in the following words:—

"It is not more than forty years since one of our scientific men, and an able one too, declared at a meeting of this Association that no steamboat would ever cross the Atlantic; founding his statement on the impracticability, in his view, of a steamboat carrying sufficient coal, profitably, I presume, for the voyage. Yet, soon after this statement was made, the 'Sirius' steamed from Bristol to New York in seventeen days, and was soon followed by the 'Great Western,' which made the homeward passage in thirteen and a half days; and with these voyages the era of steamboats began."

Some distinguished scientific men gave a verdict against it, and

prophesied its failure in no unequivocal language. To men who made no claim to be *savans*, the difficulties in the way were not less obvious. The distance to be traversed was three thousand miles of clear ocean, with no port where a vessel might run for shelter or for supplies. The quantity of coal necessary to propel a steamboat across the Atlantic seemed alone to stamp the project as impracticable. It was no doubt true that, in 1819, the 'Savannah,' a vessel of 315 tons, had performed the voyage in twenty-six days : but she used sails as well as steam, and was a week longer on the voyage than the time usually occupied by sailing-vessels. There were steamers employed in the Mediterranean and elsewhere, from which data were obtained serving to show that, to accomplish a voyage across the Atlantic, two tons of coal would be required for each horse-power of the engines ; so that if the engines were of 300 horse-power, they would consume 600 tons of fuel before they reached the end of the voyage. Allowing for a spare supply to provide against accident or delay, the quantity of coal carried would require to be raised to about 700 tons. On the other hand, it was held that if the tonnage of the vessel exceeded four times its horse-power, the latter would be inadequate to its propulsion at the ordinary rate of steamships. The tonnage, therefore, of the vessel could not exceed 1200 ; and after making

allowance for stores, machinery and boilers, the space left for fuel would not exceed 500 tons, which would be consumed before the vessel completed three-fourths of its journey !

Another and more important question was whether the enterprise would pay. A steamboat costs much more than a sailing vessel both in construction and working ; and the machinery, boilers, and fuel, occupy a large space that in a sailing vessel would be filled with goods. The number of passengers crossing the Atlantic every year was certainly great, but nearly all of these were emigrants, unable to pay the charges which steam-vessels would be obliged to make to ensure a profit. The trade also between Britain and America was extensive ; but in carrying goods could the steamer compete successfully with a sailing vessel ? Unless a remunerative passenger traffic could be created by the certainty and speed of the communication, and a favourable contract obtained for carrying the mails, it was concluded that the speculation could not succeed.

Nothing, however, is so important in extensive commercial transactions as early and regular intelligence, and a speedy transmission of goods. And from the importance of the commercial intercourse between the two countries, it was obvious that a reduction of the time to one-half, if practicable, would be of immense advantage to the commercial interests of Britain. . .

In illustration of the popular feeling on the subject, Mrs. Cowden Clarke records the following anecdote in the *Gentleman's Magazine* for 1876 :—"Upon one question of post-office reform, a proposal being made that a steam-vessel might be appointed weekly to carry letters to America, a well-known detonating legislator blared out: 'I will promise to eat the first steamboat that crosses the Atlantic!'"

As a practical test of all that this controversy implied, there was a large body of workmen engaged at Bristol in constructing the 'Great Western,' which should for ever set the question at rest. The vessel was finished in 1838, and announced to sail on her first voyage on the 8th of April. The appearance of this magnificent steamer, we are told, inspired all spectators with confidence in her fitness for the work. "Seen from a distance, she had an appearance of strength rather than of beauty; above the long black hull rose a short thick funnel and four masts; the deck, 236 feet long, was not curved like those of many other vessels, but almost straight from stem to stern; her huge paddle-boxes, distant from each other nearly sixty feet, covered wheels twenty-eight feet in diameter, to which were attached paddles ten feet long. The horse-power of the engines was 450; the weight of the boilers and machinery 300 tons, and the burden 1340, or less than three tons for each horse-power, and thus considerably

within the limit prescribed by the philosophers. She seemed a strong and compact ship, and not likely to be easily turned aside from her course by either the winds or the waves of the Atlantic Ocean. But when the visitor went on board, he was filled with as much admiration of her beauty as of her strength; the cabin accommodation was of the most splendid kind, not excelled by any hotel on shore. Sofas, couches, handsome mahogany tables, and other elegant furniture, adorned the saloons; the decorations were most profuse and elaborate; while large mirrors multiplied all this splendour. The sleeping apartments were so neat, so clean, and so comfortable, that their improvement seemed to be almost impossible. The visitor, indeed, was more likely to imagine himself in a fairy palace described in some old tale, than on board a steamship about to proceed on a long and dangerous voyage; but when the elegant and luxurious cabins were left, and he stood before the colossal machinery, wonder seemed to be exhausted, and all doubts of the success of the enterprise fled away."

The 'Great Western' sailed from Bristol on the 8th April 1838, having on board 660 tons of coal and seven passengers. Three days previously, the 'Sirius,' a smaller vessel built to ply only between London and Cork, had boldly steamed from the latter port right in the teeth of a strong

westerly wind, and with New York also for her destination. The 'Sirius,' that had the start by three days, made little way comparatively during the first week. She carried more weight in proportion than the 'Great Western;' but as her coals were consumed, she became more lively, and, in sporting phrase, 'made more running.' Thus, during the first week she was out, her daily run was never more than 136 miles: on the second day it was only 89. The 'Great Western,' on the contrary, made ten miles an hour during the second day, and her average daily speed during the entire voyage was 211 miles. At such a speed she would soon overtake the 'Sirius,' that had the start by about 400 miles only. But as the little vessel got lighter she went ahead; on the 14th she ran 218 miles, as much as the 'Great Western' on the same day; on the 22d she ran only three miles less than the large ship; but the latter was then in the same parallel of latitude, and only about three degrees of longitude behind. Still it was a close chase; but at last the 'Sirius,' by reason of her long start, was the winner. She reached New York on the morning of the 23d, while the 'Great Western' only came in the same afternoon.

"The excitement which prevailed in New York, respecting the first voyages of the 'Great Western' and the 'Sirius' was intense. Previous to the arrival of the steamers, crowds had daily col-

lected on the quay, gazing wistfully eastward over the wide Atlantic. Many of the watchers were old enough to remember the first voyage of what the incredulous had called *Fulton's Folly*, little dreaming then what the future of that *Folly* was to be; and as they now described that memorable voyage to their younger brethren, they remembered how the predictions of the wise had been falsified, and spoke in hope rather than in doubt of the success of the steamers from the Old World. And never were hopes better realised than when, on the morning of the 23d April, a streak of smoke, dim and undefined, was descried on the horizon by the watchers on the quay. 'Could it be a steamer?—' 'Was it *the* steamer?'—passed from mouth to mouth. The smoke came nearer; the hull hove up, as it were, out of the ocean, and a steamer was clearly defined advancing rapidly. The intelligence spread; the city poured out its crowds; and cheer upon cheer rose as the 'Sirius' steered into the harbour, and cast in the Hudson that anchor which, only eighteen days before, had been weighed at Cork. Scarcely had the good citizens time to recover from their first surprise, when the 'Great Western' appeared. Streaming with flags, and crowded with people, the 'Sirius' lay waiting the arrival of her competitor, and as the 'Great Western' sailed round her, three hearty cheers were given and responded to. The battery fired a salute of twenty-

six guns; and the passengers drank the health of the President of the Great Republic. "As the vessel proceeded to the quay, boats crowded round us, says the journal of one of the passengers, "in countless confusion: flags were flying, guns firing, and bells ringing!"

The 'Sirius,' which thus competed for the honour of being the first commercial steamer to cross the Atlantic, and in the sense of arriving first actually did win the race, was a wooden vessel built at Leith, and of the following dimensions:—Length 174 feet, breadth of beam 25 feet 8 inches, depth 18 feet, gross register 703 tons, and nett 412 tons. The engines with which she was fitted were of the side-lever type, of 250 horsepower nominal, cylinders 60 inches in diameter, with six feet stroke; diameter of paddle-wheels 24 feet, with 22 floats on each. She was registered at the Port of Dublin, and was owned by the St. George's Steam Packet Company. Her commander in the voyage across the Atlantic was Captain Richard Roberts, R.N. The vessel proved to be too small for the purpose of Atlantic navigation, and was withdrawn to be replaced on the station for which she was originally designed, namely between Cork and London.

The 'Great Western,' however, continued to ply till 1844, steaming altogether a quarter of a million of miles in all kinds of weather. The only accident that befell her during such service was "the loss of a bowsprit in coming

up like a whale to blow after a rather deeper plunge than usual, with fair head-way on her right course, and against a head wind and sea." The average distance steamed each voyage was nearly 3500 miles, and the time occupied in going was $15\frac{1}{2}$ days, and in returning $13\frac{1}{2}$ days. The shortest outward run made by this pioneer vessel was in May 1843, when the voyage was performed in 12 days 18 hours, and the shortest passage home was in 1842—12 days $7\frac{1}{2}$ hours. During her seventy voyages the 'Great Western' carried 5774 passengers.

THE 'GREAT BRITAIN.'

No sooner had the 'Great Western' performed her voyage to New York and back, than the directors found that steamships of larger dimensions would offer better chances of remuneration, and they accordingly determined that their second ship should be built of iron instead of wood, and propelled by the screw instead of the paddle-wheel. Accordingly, the keel of the 'Great Britain' was laid at Bristol in 1839, and the vessel was launched in 1843—the late Prince Consort acting as sponsor on the occasion. After overcoming great difficulties in being launched—arising from the fact that with her machinery on board, her lines of greatest breadth were brought too low for the gates of the dock into which she was launched—the 'Great Britain' started on her career.

This vessel was at the time looked on as a great achievement. Her total length was 322 feet, breadth 51, and depth 32. She could stow away 1200 tons of coal; the weight of the engines was 340, and of the boilers 200 tons. The engines were of 1000 horse-power; they gave motion to a drum 18 feet in diameter, which communicated by means of chains, weighing 7 tons, with another drum one-third of the diameter of the first. The latter drove a shaft 130 feet long, passing immediately above the keel to the screw, which had six arms placed in a circle—each arm about 7 feet long and shaped somewhat like the bent tail of a salmon. The screw weighed 4 tons, and turned in a space left immediately in front of the helm. Her six masts (afterwards reduced to five) could spread as much canvas as a fifty-two gun frigate; but as the masts were all low, the comparatively small crew of thirty seamen was sufficient to manage the sails of the 'Great Britain.'

The career of this ship, the marvel of its day, was stopped in a most unfortunate manner. The 'Great Britain,' when on her last outward voyage, was intended to go round by the north of Ireland, and through some blundering a light on the coast of Ireland was mistaken for that on the Calf of Man, and the 'Great Britain' went ashore in Dundrum Bay. The reports of the disaster were scarcely credited in Liverpool until the passengers came back to

tell the tale. The 'Great Britain' lay for a whole winter in Dundrum Bay, but after much labour she was towed across the Irish Sea. She was sold in the latter part of 1850 for about £18,000; and since that period, though now eclipsed in size by many vessels, she has been employed on the Australian trade, doing good service as a "steam clipper" on that route.

EXPERIMENTS IN FORM AND SIZE.

The art of steamship-building has been a vastly progressive one, and the great ship of yesterday has time and again proved to be only the small ship of to-day. In other ways than mere size there has also been progress, but only one vessel that has yet been built has united in itself both characteristics of unexampled size and novelty in the principle of construction. In face of some of the more recent inventions, it may be dangerous to say that the 'Great Eastern,' may not be eclipsed in reference to peculiarity of build, because in its general form it is substantially the same as other vessels, only differing from them in some of its lines; while the "cigar-ship" or other nautical wonders differ altogether in general contour from the usual shape of vessels. But it is hardly too much to say, we think, that the vast bulk of the 'Great Eastern' will never be exceeded.

This gigantic vessel, the design for which was due in the first in-

stance to the fertile brain of Brunel, was wrought out to its practical conclusion by Mr. Scott Russell. To Mr. Scott Russell the problem had suggested itself, What form of ship will pass most readily through the water? and, following upon that the further question, What size of vessel would prove most profitable for long sea-voyages? The question first arose with reference to the proper form of canal-boats for rapid transit, and an extensive series of experiments, continued over a long period of time, resulted in the discovery of what is called the Wave-line Principle. As the result of his observations, Mr. Scott Russell decided that what he termed the Great Primary Wave of Translation was intimately connected with the movements of a vessel through the water. He laid down several general propositions; that when a vessel passes along the surface of water with high velocity, it produces a wave of translation, moving with a velocity depending in some degree on the depth; that when the velocity of a vessel becomes greater than that of the wave of translation, the ship is carried along on the top of the wave with diminished resistance; and that in a voyage by steam in the open sea, exposed to adverse as well as favourable winds, there is a certain high velocity and high portion of power which may be accomplished with less expenditure of fuel and of room, than at a lower speed with less power.

Following out those principles, Mr. Scott Russell arrived at a certain form for the hull of a vessel, closely related to the wave-forms; that is, with the bow nearly approaching to the form of the "wave of translation," while the stern took nearly the shape of the "wave of replacement." In the course of his experiments (which are stated to have exceeded twenty thousand in number), Mr. Scott Russell also determined the point of greatest breadth. It is remarkable that in all the classes of vessels where high speed had been desired—such as, for example, slave ships and pleasure yachts—something very nearly approaching Mr. Scott Russell's carefully wrought out conclusions, had been arrived at by "rule of thumb." Coincident with the labours of Mr. Scott Russell, were made a well-known series of experiments by Dr. Scoresby, on the length and height of ocean waves. To arrive at this, Dr. Scoresby crossed the Atlantic many times, exposing himself to risks and discomforts of no ordinary kind in his endeavour to set at rest this interesting question. His observations had a singular result, as they effectually exploded the old well-worn phrase, which has done duty in many descriptions of storm and shipwreck—we refer to "waves running mountains high," and that sort of thing. According to the careful measurements of the veteran Arctic traveller, the biggest waves in a great Atlantic storm do not exceed 43 or 45 feet in depth from trough

to crest! It was, however, in relation to the length of wave from crest to crest that his studies were found of importance in regard to the form and size of a steam-vessel; his remark, that waves varied from 100 to 600 feet in length, according to the amount of "sea" on, being sufficient to prove that a vessel of 600 to 700 feet in length would always rest on the crests of two or more waves, and would therefore escape the danger of breaking her back, a fate which is by many believed to explain the loss of some at least of the large number of Atlantic steamers whose fate is unknown.

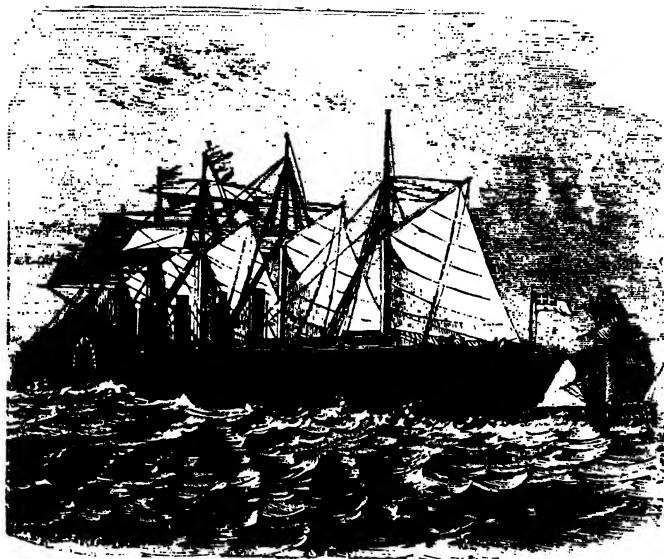
THE 'GREAT EASTERN.'

In 1852 the observations and experiments took practical form in the establishment of the Eastern Steam Navigation Company, the primary purpose of which was the organisation of a steamship service to Australia and India *via* the Cape of Good Hope. The directors came to the conclusion that to conduct such a service profitably the ships should be large enough to carry fuel for the voyage out and home, to save the loss of time in coaling abroad and the cost of transshipping coals from this country to depots suited for the trade. Accepting Mr. Scott Russell's principle, the company engaged him to build the vessel at his works at Millwall on the Thames, while Mr. Brunel was asked to supply a method of applying the cellular principle adopted in the Menai

Bridge to the hull of the vessel. The ship was four years in construction, and during that time the financial career of the company and the mechanical progress of the great ship were equally chequered. The intention was that the ship should accommodate 1000 passengers, 5000 tons of merchandise, and 15,000 tons of coal for fuel. Its original measurements (setting aside later alterations) were briefly as follows: Length, 680 feet between perpendiculars, or 692 feet over the upper deck; breadth 83 feet, or 118 feet over paddle-boxes; depth of hull, 60 feet, or 70 feet to top of bulwarks; the bottom flat for 40 feet in width, and without keel. The framework consisted of 35 ribs or webs of plate-iron, 3 feet deep, greatly strengthened, and extending from end to end of the ship, at 3 to 5 feet apart; and cross-webs of like strength, connecting these at intervals. A double skin of iron plate was placed outside and inside those ribs, thus converting the whole hull into a cellular box, like the top and bottom of the Britannia Tubular Bridge. The plates for this purpose numbered 10,000, some being 28 feet long. The cellular construction was continued along the bottom and about five feet up the side, and any one of the compartments thus formed could be separately filled with water. Ten partitions of plate across the ship divided the interior into 11 watertight cells, these being further subdivided

by longitudinal partitions. The motive-power comprised both paddle and screw. The paddle-engines had four boilers, each with 400 brass flue-tubes; there were four engines (made by Scott Russell and Co. at Millwall), with cylinders of 14 inch stroke and 74 inches diameter; the paddle-

wheels were 56 feet diameter by 13 deep, with 30 floats. The screw-engines (made by Boulton and Watt at Soho) had 6 boilers, and were four in number, each with cylinder of 84 inches diameter, and 4 feet stroke. The shaft of the screw measured 160 feet long, and the screw was 24



feet in diameter. The largest castings for this enormous vessel, which were cast at Lancefield Forge, Glasgow, were, the screw shaft 47 tons, the crank shaft 31 tons, and the stern frame 25 tons.

After many vicissitudes, practical and pecuniary, the great vessel was ready to be launched in November 1857. Partly owing to want of depth and partly

to want of width in the river Thames, the 'Great Eastern' had been built broadside-on to the river, as it would have been impossible to launch her in any other way. The ground on which she was built had been strengthened by piling to resist the enormous weight put upon the "ways." Either by some subsidence of the foundation or

the "ways" not having been designed with sufficient slope, the first attempt to launch the vessel (which was made on 3d November 1857) was a failure. The vessel was not floated until 31st January 1858, and altogether the cost of launching the ship reached the enormous figure of £60,000, the efforts to move the gigantic

structure being further attended by a number of distressing accidents. A year and a half afterwards the vessel was still lying in the Thames, the work of fitting and finishing her being delayed from want of funds, owing to the serious financial embarrassments into which the company were thrown. Leaving the question of

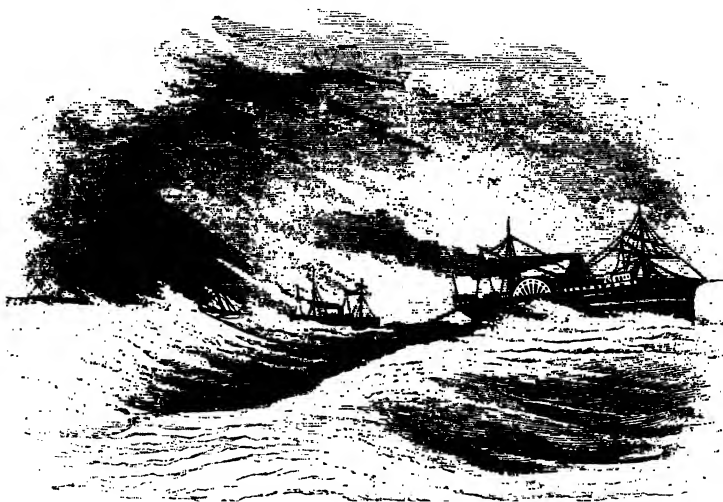


Australian traffic for further development, the owners determined to send the ship in the first instance to America, and she accordingly sailed from the Thames on 7th September 1859, anchoring that night off Woolwich, and the following night off the Nore. On the 9th September, when off Hastings, a terrible explosion occurred on board, killing seven persons and seriously

wounding many more. The result of this catastrophe was to bring the trip to a sudden termination at Weymouth. Six days afterwards, the engineer, Mr. Brunel, died, so that, though he lived to see his last and most remarkable achievement afloat on the waves, his last days were saddened by a culmination of the disasters and misfortunes that had unceasingly pursued the vessel.

The succeeding winter and spring were spent in alterations and alterations, lawsuits and repairs ; and at length, on 17th June 1860, the vessel sailed from Southampton for America, which was reached in eleven days. This speed was in no way remarkable, and though the 'Great Eastern' was, practically speaking, a great triumph, it was commercially as great a

failure. During the remainder of 1860 and 1861, she continued to sail between Britain and America, but, curiously enough, her capacity for carrying coal was in truth a source of weakness, for in that short voyage the power of carrying so much fuel was no advantage. Towards the end of 1861 the 'Great Eastern' encountered a terrible storm, when about 300



miles west of Ireland, her paddle-boxes being swept away and her steering apparatus much disordered. The freight and passengers on this occasion were the best she had yet enjoyed, but ill-fortune seemed to follow her in every respect. Three months later, that is to say in December of 1861, the vessel found a congenial and novel employment. Difficulties with the United States arising out of the

Trent affair and the war of Secession rendered it advisable to strengthen the British troops in Canada, and the 'Great Eastern' was chartered to carry out the brigade of Guards, 2000 in number, which was accomplished with so much rapidity, ease, and comfort, as to show what seemed at the time to be the true sphere of the ship.

But the peaceful times in which we live do not frequently call for

the employment of so vast a vessel, and the British Government did not again propose to charter her. The 'Great Eastern' passed the next two or three years of her life in a constant struggle with difficulties, matters getting so desperate at one time that the ship was put up for unreserved sale by auction, and realised only £25,000, or about one thirtieth part of the original cost! This was in February 1864, and probably the ship would have continued to be a failure and a misfortune to all concerned, had the project of the Atlantic Telegraph Cable not opened up to her a sphere of usefulness in which she has obtained great renown. Without the facilities the vessel presented, this enterprise would not probably have been found practicable; certainly it could not otherwise have been so easily and successfully carried out.

GENERAL PROGRESS OF STEAM NAVIGATION.

It may be useful at this point to indicate in a general way the progress of steam navigation during the half-century. Very early in the history of the steamship, it was seen that the invention would have an immense effect on naval warfare; and we find that attention was accordingly directed to this question. The absolute abandonment of sailing vessels in the navies of the world is comparatively recent, but fifty years ago, a beginning had been made in

adopting that as an auxiliary power which is now the main dependence of war ships. The following remarks from *Blackwood's Magazine* for 1827 show that there were persons who foresaw then what the full effects of the new invention would subsequently be:—

"No longer can the British first-rate man-of-war be considered the monarch of the ocean, or the gallant admiral and commander-in-chief of the British fleet pace the quarter-deck of such a ship, even in security from the attack of a little steamship with only *one gun*! For if the steam-vessel is made effectually proof against the battery of her opponent at the distance of 600 yards, and can maintain that distance, which are facts now beyond a doubt, it matters little whether the sailing ship has one gun or one hundred, since they cannot produce any serious consequences to the assailants; who, on the contrary, fire in security red-hot shot and missiles of all descriptions, every one of which must tell on their opponent, and eventually sink, or oblige the ship, which may verily be called defenceless, to strike her colours! The 'Regent,' 'Britannia,' 'Howe,' 'Nelson,' and 'Vincent,' each of 120 guns, have been built at an enormous expense about the close and since the conclusion of the late war, and none of those magnificent ships have ever been at sea. It is a lamentable truth, but it is *indeed too true*, that the best, nay the only use they can

be put to when the nation is again plunged into war is to carry coal for the steam-vessels, which will then most assuredly form the nation's bulwark, and the protection of our commerce! Alas! instead of inhabiting a *palace* like the spacious and superb accommodations of a first-rate ship of war, our gallant admirals must condescend to live in *one* small cabin, like that of a sloop of war, and the *blast* of the superfluous steam-pipe must supply the place of the band of music! Yes, there is another use they can be put to—they will make good transports—if protected by steam vessels."

War vessels cannot in any sense be deemed a "mode of travelling," and it scarcely falls within the scope of this volume to trace the course of events which have supplanted the 'fighting Temeraire,' and such like famous vessels by the nondescript 'Monitors' and 'Devastations' of the present day. It may not, however, be out of place to notice one or two of the stages in the process of conversion. The introduction of steam into the British navy nominally dates from 1821, when a steam vessel bearing the name of the 'Monkey' was purchased by the Government. It is stated that an order was given for an engine to be put on board a war vessel as early as 1815, but if so the order—which was probably an experimental one—was never carried out. In 1822, under Lord Melville's directions, a vessel called the 'Comet' was built for the navy.

It was built of mahogany, at Deptford, by Mr. Oliver Lang, and its name only recently disappeared from the Navy List. But though our fleet nominally had steam introduced to it so far back as 1821, the first actual introduction worthy of notice was in 1840, when Napier and Son of Glasgow supplied engines to two vessels, bearing the appropriate names of 'Vesuvius' and 'Stromboli.' In 1841 the screw principle—an invention of vital importance, so far as the use of steam in fighting ships is concerned—was introduced into the navy, in the 'Rattler.'

The changes of type since steam was introduced, and more especially since the introduction of ironclad vessels, has had all the rapidity of a phantasmagoria, whether we regard the form, the armament, the engine-power, or the *personnel* of the war ship. Shortly stated, it is not too much to say that without steam, ironclad vessels would not have been found practicable.

IRONCLAD WAR STEAMERS.

The Royal Navy of Britain, of which we are so justly proud, may be said to have been called into existence in the reigns of Henry V. and Henry VII., the latter of whom built the ship called the 'Great Harry,' the first vessel that deserved the name of a man-of-war. It is to Henry VIII., however, who constructed dockyards at Deptford, Woolwich, and Portsmouth, that

the merit of having formed a fleet is due; and the 'Henry Grace de Dieu,' of about 1000 tons burden, carrying 72 pieces

of cannon, was the first double-decked ship in England. The navy afterwards gradually increased; and in the reign of



Charles I., the 'Sovereign of the Seas' (built in 1637) was the finest ship of war that had been constructed up to that period.

She carried 122 guns, and was of the burden of 1637 tons.

In the year 1842, it was suggested by Mr. Balmanno, of New

York, in a letter to the Earl of Aberdeen, that plates of iron, about an inch thick, riveted one upon the other to an aggregate of 6 inches, would render the sides of a ship shot-proof. During the war with Russia, in 1854-56, it was found that horizontal shell-firing overturned all the old theories about the strength of ships; that the making of guns and shot had made greater progress than shipbuilding; and that wooden ships of war would be useless protected by an iron armour.

The earliest ironclads were floating batteries propelled by steam, built for the French and English during the Crimean war. They had no pretensions as ships, being mere floating forts, designed for the attack of land batteries, and not for sea service; they were slow, unwieldy, and in point of construction, very weak. The first example of a real ironclad vessel was 'La Gloire' in France, which was a timber-built ship, altered from a 90 gun three-decker to a 40 gun corvette, clad with $4\frac{1}{2}$ inch iron plates, and of 3000 tons burden.

It then became a matter of grave consideration for the British Government whether to case the old wooden ships with metal plates or to build new ships of which the hull as well as the armour should be of iron. Both plans were proposed to be carried out.

The old ships were accordingly transformed one by one into iron-

plated vessels. They were cut down to a much lower height above water. They were also cut in two amidships, and lengthened by the insertion of additional framing. They were then cased with armour plates about $4\frac{1}{2}$ inches thick, backed by about 30 inches of solid timber.

The 'Warrior' was the first ironclad built wholly of iron, and in 1862 she was ready for sea. She was 380 feet long, exceeding by 80 feet the wooden ships of war that preceded her, and was armoured in the middle only, with plates of uniform thickness throughout. More recent vessels, however, have had their vital parts, such as the region of the water-line, more thickly cased than those less important. The 'Warrior' was followed by the 'Black Prince' and 'Achilles;' and in 1861, the Admiralty ordered the construction of the 'Minotaur,' 'Agincourt' and 'Northumberland,' which are the noblest ships in the world except the 'Great Eastern.' They are 400 feet long, and 59 feet beam, and are propelled by engines of 1350 horse-power, and they are furnished with powerful rams protruding from their bows.

The ironclad navy of Britain now numbers many vessels, in which the plating is of enormous strength, the armour of one of the turret-ships recently constructed, having plates no less than 14 inches thick.

About the year 1861, Captain Cowper Coles invented a new method of mounting naval guns

in a circular tower or turret placed on the deck of the ship, and made to revolve by machinery. The great advantage claimed for his system is the facility it affords for training heavy guns through large arcs, and also for making the same guns available on both sides of the ship. In ordinary vessels it is impossible to have large arcs of training for heavy guns, without having large ports, thus weakening the ship's side in the immediate neighbourhood. The turret system has been found to remove this difficulty; and the turrets, besides being shot-proof, carry guns of immense size.

The first vessels fitted with this invention were the 'Monarch' and 'Captain,' with the latter of which a melancholy interest is associated. This vessel was a most formidable man-of-war, 74,272 tons, and 900 horse-power, plated with armour 8 inches thick. In her two turrets she had six guns of the heaviest calibre, and by her superior armament might have destroyed in detail all the broadside ships of the fleet to which she was attached. In her construction, however, several mistakes had been made, one of which was that her draught of water was two feet greater than was expected, and the height of her freeboard was consequently two feet less. This, combined with her large spread of canvas, rendered her liable to be easily capsized.

In the cruise in which the 'Captain' was lost she was commanded by Captain Burgoyne,

and carried a crew of 500 men. Captain Coles, the inventor of the turret system, and other visitors, were on board. When off Cape Finisterre, on the evening of the 6th September 1870, this vessel was the last ship of one of the divisions of Admiral Milne's squadron. A gale sprang up about 1 A.M., and square sails were furled.

"At this time," Admiral Milne reported, "the 'Captain' was astern of the 'Lord Warden,' apparently closing under steam. The signal 'open order' was made, and at once answered; and at 1.15 A.M. she was on the 'Lord Warden's' lee until about 1.30 A.M. I constantly watched the ship; her topsails were either close-reefed or on the lap; her fore-sail was close up, the main-sail having been furled at 5.30 P.M., but I could not see any fore and aft set. She was heeling over a good deal to starboard, with the wind on her port side. Her red bow light was all this time clearly seen. Some minutes after, I again looked for her light, but it was thick with rain, and the light was no longer visible. The squalls of wind and rain were very heavy; and the 'Lord Warden' was kept, by the aid of the screw and after-trysails, with her bow to a heavy cross sea, and at times it was thought that the sea would have broken over her gangways. At 2.15 A.M. (the 7th) the gale had somewhat subsided, and the wind went round to the north-west, but without any squall;

in fact, the weather moderated, the heavy bank of clouds had passed off to the eastward, and the stars came out clear and bright; the moon, which had given considerable light, was setting. No large ship was seen near us where the 'Captain' had been last observed, although the lights of some were visible at a distance. When the day broke, the squadron was somewhat scattered, and only ten ships instead of eleven could be discerned, the 'Captain' being the missing one.' Search was made in all directions by the ships of the squadron, but nothing was seen of the missing ship. Afterwards portions of wreck belonging to the 'Captain' were picked up, and the body of a seaman." Admiral Milne said he could come to no other conclusion than that the 'Captain' had foundered, probably in one of the heavy squalls between 1.30 and 2.15 A.M., at which time a heavy cross sea was running.

Mr. May, the gunner, and seventeen men, who formed the watch on deck, were all who were saved. Mr. May related that, feeling the vessel uneasy, he left his cabin soon after midnight, and proceeded to the after turret to look at the guns, when he suddenly felt her heel steadily over. A heavy sea struck the ship on the weather side, and she then turned gradually bottom upwards, and went down stern foremost in two or three minutes. Mr. May was washed overboard out of the top of the turret, and was eventually

picked up by one of the launches, the boat in which all the survivors were saved.

The launch, with Mr. May and the rest of the survivors, bore up for the land, and after twelve hours' pulling, without food or water, reached Finisterre, from which place they proceeded to Corcubion, and were taken on board the 'Monarch' on the afternoon of the 9th, and reached Portsmouth in the 'Volage' on the 12th of September.

In 1871, a very powerful turret-ship, called the 'Glatton,' was constructed at Chatham from the designs of Mr. E. J. Reed, C.B. This vessel is 245 feet long, and 54 feet broad. Being built on the pure turret principle, the 'Glatton' has an exceedingly low freeboard, or height of her sides out of the water. In the single turret are placed two 25 ton guns, each capable of firing a shot of 600 lbs. Her armour-plating is 12 inches above the water-line, with a teak backing of 20 inches. On the turret the plates are 14 inches thick. This vessel is constructed on the double-bottom unsinking principle; but she can be submerged to any depth by water ballast, pumped into tanks specially fitted for the purpose. The 'Glatton' is not a sea-going vessel, and can only carry about 600 tons of coal, but she is well adapted for coast defence.

Two other vessels, called the 'Thunderer' and 'Devastation,' have since been constructed, both of which are larger than the

'Glatton,' being 288 feet long and 58 feet wide. Both have two turrets, with two rifled muzzle-loading 35 ton guns in each. They have no sails ; and there is a clear range for the guns in every direction. They can each carry 1800 tons of coal, can go at a speed of fourteen miles an hour, and can perform long voyages without re-coaling.

When the 'Warrior' was designed, it was proposed to revive an ancient method of naval warfare,—that of disabling or sinking an enemy by ramming. In her, and in all the subsequently-constructed ironclads, this has been kept in view, and the bows have been strengthened for this purpose. In fact, the rams of these ironclads render them formidable antagonists at close quarters, even if their guns were not used.

During the American war both sides availed themselves of this method of attack ; and many of the engagements, particularly those that took place on the Western rivers, were decided not by artillery but by ramming.

In an engagement at Lissa between the Austrian and Italian fleet, the defeat of the latter was due to the excellent performances of the Austrian ship 'Ferdinand Max,' which rammed and sank the 'Re d'Italia,' and damaged other ships severely.

An accident took place in 1875, by which the strength of large ironclads to resist the rams with which they are provided was tested. On the morning of the

1st September, the Channel squadron was sailing from Kingstown to Queenstown. A dense fog came on, which totally prevented one ship from seeing another. The fleet was at the time running at the rate of from twelve to fourteen miles an hour. About one o'clock the lookout on the 'Vanguard' noticed a large vessel apparently bearing down upon them. The officer in command gave orders to the steersman to put his helm down, so as to keep clear of the vessel. This was unfortunately too late to avoid a collision with the 'Iron Duke,' which, coming up behind, struck the 'Vanguard' amidships with tremendous force, and inflicted such dreadful injuries that the 'Vanguard' commenced to fill directly, and within one hour sank in 19 fathoms of water.

The iron plating of the vessel, $4\frac{1}{2}$ inches thick, extended five feet below the water-line ; but notwithstanding this, the 'Iron Duke's' plough crushed her iron plates as if they were nothing more than tinned ware, and the water rushed into the hold at once in a regular torrent. The officers, with a crew whose discipline was sailorlike throughout, did all they could to forestall the danger, by endeavouring to close the compartments of the ship ; but holes had been cut for ventilation which permitted the water to penetrate through every section. Meanwhile the boats of both ships were promptly lowered, and within twenty minutes the 400 men of the

'Vanguard' were safely transferred on board the 'Iron Duke.'

THE FIRST IRON BOAT AT SEA.

The recent publication of the *Life of Sir William Fairbairn* has brought under notice the part that celebrated engineer played in the improvement of the speed of canal-boats described on pages 308-10, and the fact that his experiments led to one of the earliest sea voyages in an iron steamer. Iron had been employed even in the eighteenth century in the construction of canal-boats, but in 1821, the first iron boat that ever put to sea was built at the Horsley Ironworks, in Staffordshire, by Mr. Aaron Manby. This vessel, named after her builder, was 120 feet long, 18 feet beam, and possessed an engine of 80 horse-power. Being sent to London in parts, she was there put together, and sailed down the Thames, across the Channel, and up the Seine to Paris. This, the earliest voyage of an iron boat in deep water, was performed under command of Captain, afterwards Admiral Sir Charles Napier, who took a great interest in the enterprise.

Sir William Fairbairn was the first to solve, practically, the question of lightness combined with strength in an iron boat, and his ship was also instrumental in solving an important difficulty presented by the use of iron in sea-going boats. The 'Lord Dundas,' the first eventful voyage of which is here recorded, was built

at Manchester, and launched in the Irwell in 1831. The vessel, 68 feet long, $11\frac{1}{2}$ feet wide, and $4\frac{1}{2}$ in depth, weighed 7 tons 16 cwt. (including engine) being built specially with a view to lightness. Its engine was 10 horse-power, built on the locomotive pattern, and it worked a single paddle-wheel of 9 feet diameter, placed in a trough running fore and aft in the centre of the vessel, to admit of the necessary flow of water. After some experiments to test speed, on the Irwell and the Mersey, the little iron steamer left Liverpool early one morning in June 1831. Before 2 P.M. the captain was, as he thought, in view of the west side of the Isle of Man, but he could not reconcile his course and his chart; this being explained when, on nearing the shore, it was found to be not the Isle of Man but the coast of Cumberland. The rest of the story, which involves an interesting discovery with reference to the influence of iron vessels upon the compass, must be told in Sir William Fairbairn's own words:—

"This very wide discrepancy between the course apparently steered and the position of the little vessel completely upset the calculations of the skipper. He maintained that he was correct in his course; but before he had time to settle the difference, he had to 'bout ship' and run for Morecambe Bay in order to avoid a stiff breeze which commenced blowing from the west. Here they took shelter for the night;

and it was the afternoon of the next day before they were able to weigh anchor, and sail for the place of rendezvous, Douglas, in the Isle of Man. It was here I had to meet them, and for that purpose I sailed for that port in the afternoon of the day they left Liverpool. When I reached Douglas, I found, to my surprise and great disappointment, that such a vessel as I had described had never been seen; and, alarmed at this non-arrival, I took the first vessel for the Clyde, conceiving they must have gone on.

"On arriving at Greenock, there was still no account of the vessel; and there being six persons on board—Mr. Elliot (my superintendent) an engineer, a stoker, the captain and two sailors—I felt all the misery and responsibility of having been in some degree, if not entirely, the cause of a serious loss of life. Labouring under these painful feelings, I went down to the Comries (Cumbraes), and in a little boat searched all the islands and made inquiries in every direction, but without effect.

"Feeling great uneasiness and alarm, I became dreadfully nervous, and, after spending a great portion of the day in a fruitless search, I returned to Greenock, and took the first vessel I could find for the Isle of Man. On my second arrival at Douglas I made instant inquiries about the vessel, and to my great relief I found that one answering the description had reached Ramsey, and was then at

anchor in the bay. This information was welcomed with a thankful heart, and there never was a journey undertaken with more heartfelt satisfaction than mine, on an old horse, from Douglas to Ramsey. On reaching the summit of the last hill, which overlooks the bay of that town, the first sight that met my eyes was the 'Lord Dundas,' like a speck on the waters, riding quietly at anchor on a sea as smooth as glass.

"Hurrying down the hill, I made inquiries for Mr. Elliot and the captain, but no person could give me any information. At last a sailor informed me that I should find them at a public-house in the neighbourhood. On inquiring I learnt they had been there, but were all gone to a country fair, about five miles inland, where they were enjoying themselves, without once thinking on the misery I had endured on their account for the last three days. At first I felt annoyed at their behaviour, but, after a little reflection, I was but too glad to find them in the land of the living, and waited their return with perfect good will and a determination to give them a cordial reception.

"On the return of the party from the fair I soon ascertained the cause of the mistake which had occurred in making the coast of Cumberland instead of the Isle of Man; and, in order to prevent any further errors, I had the compass examined the following morning before sailing."

The plan adopted by Sir Wil-

liam Fairbairn was, by comparison of the compass on board with one on shore, to register the deviation. In short the 'Lord Dundas' underwent the process known at a later period as "swinging the ship;" and the biographer of Sir William Fairbairn rightly claims, as a proof of great ability on the part of the engineer, then a young man, that he at once discovered the source of the error, determined by experiment its exact amount, and proposed the immediate application of an efficient remedy. The nature of the remedy is described in the further narrative of this interesting voyage, which may be truly characterised as a voyage of discovery.

"To remedy this error," continues Sir William, "there was no difficulty, as the natural suggestion was to place a piece of iron in the opposite direction of the ship's attraction, until the needle on board was brought to a line parallel to that on shore. With this rough-and-ready correction we proceeded on our voyage with perfect certainty and without any further mishap." When the little vessel reached Portpatrick it did not propose to stop, but two naval officers, who had been watching the ship for about two hours with their glasses, came off in a boat to examine it. They expressed great astonishment at the nature of the vessel and the boldness of its navigators, as well as pleased with the build and machinery, and when they landed several hundreds of persons, who had assembled on

the pier, hailed with cheers the lively little craft."

The first steamer built of iron on the Clyde was the 'Aglaia,' of 30 tons, launched in 1827, and which plied on Loch Eck to facilitate the journey to Inverary. The first iron steamer to ply on the Clyde was the 'Fairy Queen,' built in 1831. The first really large iron steamers for sea-going purposes were the 'Royal Sovereign' and 'Royal George,' built by Tod and Macgregor, for the Glasgow and Liverpool trade, in 1838. "They were the first vessels of any size so constructed, and it was predicted by many seafaring men that they must prove failures; but the predictions were not realised, as the steamers were found to possess all the good qualities of wooden ships besides advantages peculiar to themselves." The first Clyde-built iron vessel, fitted up with a screw propeller, was the 'Fire Queen,' launched in 1845.

STEAMERS IN COMMERCE.

"The natural effect of commerce," says Montesquieu, "is to foster and consolidate peace." It is perhaps a mere truism to add that this becomes more and more evident as facilities for commerce are increased, as they have been by steamboats. That they have banished war cannot certainly be asserted, though, as we have seen in the case of the transport of the Guards to Canada, they may help those who wish peace by enabling

them to be prepared for war. In the vast development of steam navigation a great deal has been done to supplant sailing vessels by steamers, and many persons are disposed to attribute the alleged "deterioration of the British seaman," of which so much has been heard, to the transfer of the services of the best men to the mercantile steam fleet. The operation arises in this way, that as better wages and shorter absences from home are offered, the best men command the engagements, leaving the refuse and the "long-shore men" to man the sailing vessels, where seamanship is, however, most wanted.

THE OVERLAND ROUTE.

We have seen that so early as 1825 the voyage to East India *via* the Cape of Good Hope had been accomplished by a steamer, the 'Enterprise;' while five years earlier the French 'Voyageur' had reached Senegal on the coast of Africa. The four quarters of the globe had thus in a manner been reached within a dozen years of the introduction of steam navigation; but a considerable number of years elapsed before the art reached such a state of development as to create a regular trade by that method of navigation. The opening up of the Overland Route to India marked the next step in onward progress, the first contract with the now celebrated "P. and O." Company being completed in 1840.

Shortly before this, an interesting enterprise is recorded to have been entered upon. A company of Liverpool merchants, in fitting out the expedition under Mr. Richard Lander to explore the Niger and the Quorra, determined to give a steamboat a trial. The steam vessel was formed of wrought iron, with a light draught of water, and burden fifty-five tons. This vessel was named the 'Alburkha,' signifying "blessing," and was intended to explore the small streams flowing into the Niger, and to proceed higher up the river than the 'Quorra' could penetrate in consequence of her draught of water. A writer in the *Nautical Magazine* aptly observes that "a new era in the annals of maritime enterprise will be dated from the departure of this expedition, in the circumstance of a vessel constructed of iron first going to sea."

Reference has been made to the contract, of the Peninsular and Oriental Company. Before, however, this company came on this extended field, the two governments, those of Great Britain and India—the latter being "John Company" in those days—undertook the task of shortening the postal distance between the mother country and her great dependency by carrying the mails by the Overland Route. Our concluding chapter on canals has so far overlapped the present branch of the story, that the labours of Lieutenant Waghorn have been described as superseded before the narration of how they were brought into opera-

tion. The reader must bear this in mind when we now proceed to describe the plan of the improved communication to India, which was to convey the mails by steamer to Alexandria, and thence overland by Cairo and Suez, involving a land transit of only eighty-four miles. The British Government undertook the route between England and Egypt, and the East India Company that between Egypt and India. In 1837 the arrangement came into operation; the mails were sent from Falmouth to Gibraltar in the vessels then engaged in the postal service to Portugal and Spain; at Gibraltar they were transferred to naval steamers, which conveyed them to Alexandria; they were then taken up the Nile to Cairo, and from thence across the desert to Suez, where the 'Hugh Lindsey,' a steamer belonging to the East India Company, conveyed them to Bombay. The time at first occupied was between fifty and sixty days, so that the communication with India was reduced at once by one-half. In order farther to reduce this time, a treaty was made in 1839 with the French Government to forward a portion of the mails through France to Marseilles, from whence they went to Malta, and there met the steamer from Gibraltar.

Two years before this time a regular postal steam communication had been established between England and Spain. The Peninsular Steam Company, on 22d August 1837, entered into a contract with Government to carry

mails weekly from Falmouth to Gibraltar, calling at Vigo, Oporto, Lisbon, and Cadiz; and for this service the payment was £29,600 per annum, being less than the cost of the old, slow, and irregular sailing ships. In 1839, Government being anxious still further to accelerate the Indian mail, requested the company to submit a plan for the attainment of that object. This was done; the company proposed to establish a line of large and powerful steamers of 450 horsepower, to run direct from England to Alexandria (calling only at Gibraltar and Malta), thus avoiding the delay of transferring the mails from one packet to another, and rendering the communication by Gibraltar nearly as speedy as that through France. The Government adopted the plan, but advertised for tenders. Four were made; the highest being for £51,000 per annum, and the lowest (that of the Peninsular Company) for five years at an average per year of £34,200, which was accepted. The company procured two large vessels, the 'Oriental' and the 'Great Liverpool,' and with these and two smaller vessels the service was begun in September 1840.

The postal communication with Bombay having thus been made speedy and regular, it was proposed to improve also the communication to Calcutta, Madras, Ceylon, and China. A contract was entered into with the Peninsular and Oriental Company, by which that company undertook, for the sum of £160,000 per annum, to con-

vey the mails from Suez to Ceylon, and from thence northwards to Madras and Calcutta, and eastwards to Penang, Singapore, and Hong Kong. This contract was commenced on the 1st January 1845, by the three fine steamers, the 'Bentinck,' 'Hindustan,' and 'Precursor,' of about 2000 tons burden each, and 500 horse-power. Thus, in less than ten years from its first establishment, this company, which originally sent its steamers no farther than Gibraltar, was navigating the Mediterranean, the Red Sea, and the Indian Ocean, connecting the European shore of the Atlantic with the Asiatic shore of the Pacific, and conducting a constant communication between England and China.

A year or two ago a strong movement was made to open up the India and China mail contract, but the excellent service of the "P. and O." enabled that company to beat off all its interested assailants.

THE ROYAL MAIL STEAM PACKET COMPANY.

The West Indies were connected with Europe by a steam mail packet line in 1840, when the labours of the Royal Mail Steam Packet Company were begun. The value of the trade to Central and South America was such that it became a necessity to take advantage of the new system of conquering the ocean as soon as possible. Consequently, on 20th March 1840, a contract was com-

pleted between the Admiralty and the Royal Mail Steam Packet Company, in which the latter agreed, for the sum of £240,000 per annum, "to provide, maintain, and keep seaworthy, and in complete repair and readiness, for the purpose of conveying all her Majesty's mails, a sufficient number (not less than fourteen) of good, substantial, and efficient steam-vessels, of such construction and strength as to be fit and able to carry guns of the largest calibre now used on board of her Majesty's steam vessels of war, each of such vessels to be always supplied with first-rate appropriate steam-engines of not less than 400 collective horse-power, and also a sufficient number—not less than four—of good, substantial, and efficient sailing vessels, of at least 100 tons burthen each." The original plan of the service was described by one of its promoters as a scheme "which united the British colonies in North America with the British colonies within the northern tropic; which made Barbadoes the highway from all Eastern South America to Europe and to North America; which made Jamaica the great road from all Western America and New South Wales to Britain; which made Nassau the central point to catch everything from and to the Gulf of Mexico; and which connected all the western world in one unbroken line of rapid and regular commercial communication." The contract was to be for ten years, to commence on 1st December 1841. The company had

thus less than two years to make preparations for the enterprise.

Twenty vessels, fourteen of them steamers of the largest class then known, had to be built, equipped, and manned by the best crews that could be obtained. Arrangements more complex than those necessary for a voyage to North America were required ; for while the ocean voyage was in each case equally easy, the branch lines necessary to accommodate so many different islands could only be maintained by skilful arrangement and efficient management, for which, in past experience, there was no example. The company, though unable to commence the contract on the 1st December 1841, began only a month later—on the 1st January 1842. Sir George Cockburn, then holding office at the Admiralty, expressed his opinion that even the Government, with its great naval resources, could not have succeeded so well as this private company in getting so many steamers ready for sea in the time. The vessels were named after the chief rivers of the kingdom, namely: Thames, Medway, Trent, Isis, Severn, Avon, Tweed, Clyde, Teviot, Dee, Solway, Tay, Forth, etc.

In July 1850 the British Government advertised for tenders for conveying the mails monthly between England and the Cape of Good Hope, calling at Madeira, Sierra Leone, and St. Helena. The vessels were to be of not less than 200 horse-power, and to perform the voyage at a speed of not less

than eight knots, or about nine miles, an hour. This contract was obtained by the General Screw Steam Navigation Company, who undertook to perform the voyage at the rate of 223 miles per day. The first vessel, the 'Bosphorus,' left Plymouth on the 18th December 1850.

THE CUNARD COMPANY.

As representative of the spirit of enterprise which has distinguished the history of British endeavour in the spread of steam navigation, and the laurels of success with which it has been crowned, the Cunard Company holds a distinguished place. When the 'Great Western' had proved the possibility of crossing the Atlantic, the British Government advertised for tenders to convey mails between the shores of England and America. The owners of the 'Great Western' and the 'Sirius' both tendered for the service, but the offers were not accepted. Shortly afterwards Sir Samuel (then only Mr.) Cunard made an offer which was eventually accepted. He was to receive £65,000 per annum for a mail once a fortnight between Liverpool and Halifax, Quebec, or Boston. The 'Britannia,' a steamer of about the same dimensions as the 'Great Western,' and which left Liverpool on 4th July 1840,¹

¹ In *Glasgow and the Clyde Valley*, Mr. Mayer says the vessel arrived at Boston on 4th July, when the inhabitants were celebrating "Independence."

was the first vessel employed in the fulfilment of a contract which, ere its close at the end of thirty-six years, made the story of the Cunard Company familiar as a household word in the mouths of both nations.

A recent writer says of this story that it is "one far more worthy of record than the wars for maritime supremacy between Rome and Carthage, or than, perhaps, some wars of more recent times, which, without any apparently useful object, have stained land and sea with the blood alike of the victor and the vanquished, rendering desolate many a once happy home. The war I have now to relate was a far nobler conflict, consisting as it did in the struggle between the genius, scientific skill, and industry of the people of two great nations, commenced, too, and continued throughout without bloodshed and with a fair field, neither country having, in the direct trade, any special legislative advantages."

Mr. Cunard, had, it is believed, as early as 1830, suggested a mail service between the two continents, and knowing that the home of the fast developing power was on the Clyde, he proceeded thither with a letter of introduction to Mr. Robert Napier, engineer and ship-builder, and through him he was introduced to Mr. Geo. Burns and his friend, Mr. David MacIver, of Liverpool. To these three far-seeing, able, and enterprising men we owe the world-famed Cunard Company. The first contract with

the Government to carry the Transatlantic mails was entered into in the names of Samuel Cunard, Geo. Burns, and David MacIver. Mr. George Burns, whose practical ideas were of the highest value in carrying out an enterprise so new and so important, was, at the beginning of 1877, the only living representative of the illustrious trio who began the Cunard Company. He played so prominent a part in the great work that we need not hesitate to reproduce the following interesting particulars of his career from Mr. Lindsay's *History*:—"Mr. George Burns, whose family held a high position in the city of Glasgow (his father having been for the very long period of 72 years the minister of the Barony Parish of that city), entered into partnership with his elder brother, James, in 1818, and in that year founded the great firm still carried on in Glasgow. The business thus created was, in its various branches, carried on by Messrs. Burns in Glasgow, by Messrs. MacIver in Liverpool, and by Messrs. Cunard in Halifax, N.S., and subsequently in New York, under the management of Sir Edward Cunard, Bart. Mr. David MacIver died a few years after the formation of the Cunard Line. Sir Samuel Cunard, Bart., and his son, Sir Edward, who died more recently, have been succeeded by Mr. William Cunard, and Mr. George Burns, of the original three, alone survives. The business is now carried on by his two sons, Mr. John Burns (whose

abilities and philanthropy are alike conspicuous), and his brother, Mr. James Cleland Burns, and in Liverpool by Mr. Charles MacIver (a gentleman of remarkable energy and ability), and his sons. It will be seen from the above that Mr. Burns was thoroughly familiar with steam navigation from actual experience in his own business long before the 'Great Western' was built, and this special knowledge no doubt greatly assisted in placing the Cunard Company on a basis of security which would have been unattainable without such knowledge. In contemplating the biographies of eminent men, the services of those who have been most useful to mankind are often passed over, and the palm of honour is mentally awarded to those whose lives have been illuminated by the lurid light of war. But if ever the world's benefactors are estimated at their real worth, the names of Samuel Cunard, George Burns, and David MacIver will rank among those who, by their gallant enterprise, have made the world richer by giving an unprecedented stimulus to commerce, and who have rendered inestimable service to the people of every country. For it was not merely in establishing the first line of Atlantic mail steamers that they deserved credit, but in the framing of the rules for the management of their fleet which has led to such magnificent results.

"Appreciating the great responsibility there was upon them, they made their plans yield at every point

to secure one grand object—safety. They might, without laying themselves open to any complaint, have reduced the cost of their service by minimising the labour employed, and they might also have engaged a cheaper kind of labour than that which they have always used. But from the first, to their honour be it said, they sacrificed everything to safety. Precious human lives were entrusted to their keeping, and whatever else had to give way, they were inflexible on this point. Safety first, profit second, was their practical motto; and as good wine needs no bush, the public soon found out the high character of the firm, and from its establishment to the present time this great character has been maintained.

"The company (which is a private undertaking, belonging exclusively to three families, consisting of Messrs. Burns, Messrs. MacIver, and Mr. Wm. Cunard) owns 49 steam vessels of 90,208 tons, and 14,537 horse-power. Of the good fortune of the company all the world is aware. This has been attributed to "good luck," but after reading the instructions given to their officers every one must admit that it is management, in its most literal sense, and not chance, which has enabled the Cunard Company to preserve and increase the high reputation with which they began. The Cunard Company have now afloat, and engaged in their Transatlantic service alone (independent of their Mediterranean and other fleets), no less than 23 magnificent

steamships and 2 steam tenders, of a gross registered tonnage of 64,718 tons, and 10,000 horsepower. And here I must state that, though they have for thirty-five years been traversing the stormy ocean, now almost daily, with surprising regularity and during the most tempestuous weather, they have only lost two vessels; but it is still more remarkable—indeed, it is an extraordinary fact—that neither life nor letter entrusted to their care has been lost through shipwreck, collision, fire, or any of the too frequent causes of disaster, during the numerous voyages made by the Cunard steamers across the Atlantic. How is this? Here is a problem well worthy of solution, and one, too, of great national importance. With these facts in view, and having before them the regulations of the Cunard Company, with the knowledge, also, of the perfect safety with which their ships have traversed, at the highest rate of speed for a long series of years, one of the most stormy oceans; one, too, where icebergs abound, and where far more ships navigate than anywhere else, they may ask themselves with advantage this question, and study it in their own minds—Cannot this list of melancholy maritime casualties be materially reduced? It can and must.

“Opinions may differ widely as to the most effective mode of carrying into practice the means at our disposal for bringing about a more satisfactory state of things than

exists at present. But the work has to be done, and ought to be done, when the great fact, which cannot be too often repeated, is considered that the Cunard Company's steamers have for thirty-five years constantly traversed the Atlantic without the loss of the life of a passenger, or of a letter entrusted to their care. Some persons may say that this arises from extraordinary ‘good luck.’ As a rule, I have no faith in such old sayings; good or bad luck are expressions only applicable to games of chance where no skill, genius, industry, or prudence, are required, and where every man has an equal opportunity of winning a prize. In all other matters success depends on the means applied to obtain it. And there can be no doubt that the freedom from accident on board the ships of the Cunard Company may be attributed almost entirely to the wise measures adopted to prevent casualties, and to the rigour with which they are enforced. If this conclusion is sound and borne out by the facts, why should we not make the rules of that company, or similar rules adopted by other steam lines, the bases of our maritime legislation, especially in passenger ships, and enforce them by legislative enactment? We could thus dispense with a large portion of the confused mass of maritime legislation now in force, and from its extent, in too many cases, practically worthless.”

To this testimony from a

practical man it is not necessary we should add many words. The fleet of the Cunard Company embraces many of the finest specimens of marine architecture in existence. The finer types of vessel in the fleet are the 'Persia,' built in 1857, a magnificent ship of 3600 tons and 900 horse-power, the 'Scotia,' a still larger vessel, added in 1862, of 3870 tons burden, and 1000 horse-power, and the finest steamer of the fleet, the 'Bothnia,' which was launched in 1874 at Dalmuir, near Glasgow, and is a screw-steamer of upwards of 4500 tons burden. Her length is 453 feet, breadth of beam 42 feet 6 inches, and depth 36 feet. She carries two compound engines of 600 horse-power, has four decks, is barque-rigged, and has eight boilers heated by twenty-four furnaces, with stowage sufficient for 1200 tons of coal. She can carry with comfort 300 first-class and 800 third-class passengers. Another steamer, the 'Scythia,' is of the same dimensions. The fleet of forty-nine steamships, with a tonnage of 90,000, and nearly 15,000 horse-power, far exceeds the navy of the Empire of Germany.

To the Atlantic steam fleet was added, subsequent to the establishment of the Cunard Company, the vessels of the "Collins" line, the "Inman" line, the "Anchor" line, the "Allan" line, the "White Star" line, the North German Lloyd's steamers, the "Guion" line, and several others, the service between Europe and the leading

ports of North America being of a most magnificent and complete kind. At one time there were to be seen, perhaps, twenty steam vessels of the highest type sailing in one week from each side. In the year 1876, however, a general depression came upon this trade, and many fine steamers were "laid up in ordinary" owing to want of freight.

SPEED AND ROUTE ON THE ATLANTIC.

The best port from which to arrive and depart has been a question of controversy for many years, and perhaps the subject can hardly be said to be yet decided. The Atlantic Mail Steam Company, established to trade from Galway, on the west of Ireland, proved a signal failure, and after a few voyages over the Atlantic, the enterprise collapsed. Freight, on which the success of a great steamship company depends even more than on passengers or mails, is of a conservative turn, or perhaps we should be more correct in saying that it must be sought where it can be found, and not asked to go out of its way in search of vessels to carry it. Experience has demonstrated, that while a service may to some extent be maintained with the less important ports in America, the voyage from Liverpool or Glasgow to New York must form the foundation and the leading feature of trade across the North Atlantic. That this is so is seen in the very general

discontent aroused in the beginning of the year 1877, by the action of the British Post-Office in regard to the American mail service. On the expiry of the contract with the Cunard, the Inman, and the North German Lloyd's Steamship Companies, the Post-Office determined to make no further contracts, but to send the mails by any steam company that would carry them, with the condition, however, that vessels taking the mails should call at Queenstown for and with the extra mails sent from London by rail and across the short channel passage. The complaint was made that the payment was not sufficient to compensate for the time lost in making this call ; and on the side

of the trading public it was made a special complaint that the fastest steamers on the route would not call on any terms, so that goods sent by them had to be invoiced several days before, or reach the other side before the invoice.

But while, as regards freight, the great packet lines find it disadvantageous to make calls which their ordinary business as carriers of goods and passengers do not require of them, there is much to be said in favour of the establishment of a good and rapid service for mails and passengers by the shortest possible route. As bearing on this subject we give below the average and shortest passages out of a large number of sailings by the leading lines crossing the Atlantic:—

LIVERPOOL AND NEW YORK.

<i>Inman Line.</i>		West Passage.			East Passage.			Mean.	
Average of 52 Eastern and 52 Western passages		d.	h.	m.	d.	h.	m.	d.	h.
		13	19	11	12	18	51	13	7
Shortest passages		11	5	0	10	5	0	10	17

<i>Cunard Line.</i>									
Average of 27 Eastern and 25 Western passages		11	12	46	10	11	42	11	0
Shortest passages		9	17	0	9	3	0	9	10

SOUTHAMPTON AND NEW YORK.

<i>Hamburg Line.</i>									
Average of 23 Western and 25 Eastern passages		13	11	46	12	15	53	13	1
Shortest passages		10	9	0	10	17	0	10	13

<i>Bremen Line.</i>									
Average of 20 Eastern and 22 Western passages		14	8	27	12	9	42	13	9
Shortest passages		10	17	0	10	19	0	10	18

As regards the more recently established "White Star" line, a statement of a year's voyages, issued by the owners, shows that from Queenstown to New York

the average time of the 'Britannic' on three voyages was 9 days 12 hours 13 minutes ; of the 'Baltic' on nine voyages, 9 days 13 hours 25 minutes ; of the 'Adriatic' on

eight voyages, 9 days 18 hours 9 minutes; of the 'Celtic' on nine voyages, 9 days 18 hours 41 minutes; of the 'Republic' on ten voyages, 9 days 21 hours 37 minutes; and of the 'Oceanic' on nine voyages, 10 days 4 hours 3 minutes. The homeward voyages, from New York to Queens-town, show that the time of the 'Adriatic' on seven voyages averaged 8 days 6 hours 42 minutes; of the 'Baltic' on nine voyages, 8 days 10 hours 46 minutes; of the 'Celtic' on nine voyages, 8 days 16 hours 54 minutes; of the 'Britannic' on three voyages, 8 days 20 hours 42 minutes; of the 'Republic' on ten voyages, 9 days 40 minutes; and of the 'Oceanic' on ten voyages, 9 days 8 hours 57 minutes. The run from New York to Liverpool has frequently been made within the nine days, allowing for the difference of time. The Cunarder 'Scotia,' the largest paddle-steamer afloat, has accomplished this, as have also a few other vessels. While the mean average of all these passages, made between Liverpool or Southampton and New York, ranges from 9 days up to 13 days 9 hours, it has been estimated that by Ireland, Newfoundland, and Shippigan, the passage could be made in 7 days 3 hours, nearly four days less than the mean average, and considerably less than the shortest passage on record. These advantages alone are sufficient to attract the attention of business men, but the great recommendation of the Newfoundland passage to most

travellers would, according to the advocates of this route, be the shortening of the ocean passage proper from 264 hours (the average by the Cunard line) to 100 hours.

The distance between St. John's, Newfoundland, and Valentia, in Ireland, is not much more than half the distance between Liverpool and New York; and hence about half the quantity of coal and supplies would be required for the passage between the former points. It has been suggested that a steamship, constructed specially to run between St. John's and Valentia, and for the purpose of carrying only passengers and mails, with such light express matter as usually goes by passenger trains, would attain a higher rate of speed than existing ocean steamers. A rate of 16½ miles per hour is thought to be quite possible: and, as the distance between Valentia and St. John's is 1640 miles, at this assumed rate the ocean passage might be accomplished in 100 hours. With regard to the speed on land, it appears from *Bradshaw* that the Irish mails are regularly carried between London and Holyhead at the rate of 40 miles an hour, including stoppages; that the Irish Channel is crossed at the rate of 16 miles an hour, including the time required for transshipment at Holyhead and Kingston; and that the mails reach Queenstown some 16 hours after they leave London. Valentia is very little farther from Dublin than Queenstown, and on the completion of a railway to Valentia, there is nothing to prevent it being

reached from London in the same time now occupied in carrying the mails to Queenstown. Galway, which has already been tried as a port for a mail service across the Atlantic, is fully an hour nearer London than Valentia, but is probably three hours, reckoning by steamer time, farther from America. Although 40 miles an hour is a common rate of speed on the railways in England, it is not usual to run so rapidly on the American side of the Atlantic. On the leading passenger routes in the United States, 30 miles an hour, including stoppages, is attained. With the rail-track and rolling stock in a good condition, there is no difficulty in running at these rates of speed. Therefore, a minimum rate of 30 miles an hour has been assumed as that at which the mails might be carried overland to the various points referred to below. Having fixed upon a practicable rate of speed by land and water, the time necessary for the conveyance of the mails from London to New York, by this projected route, can be ascertained.

From London to Valentia, at present rate of speed in England .	16 hours
From Valentia to St. John's, 1640 miles, at 16½ miles per hour .	100 "
From St. John's to St. George's .	8½ "
From St. George's to Shippigan, 250 miles, at 16½ miles per hour .	15½ "
From Shippigan to New York, 906 miles, at 30 miles per hour .	31 "
Total	171 hours

It is thus endeavoured to be shown that (without reference to the invention noticed on page 423), it would be possible to carry the mails from London to New York in 171 hours, or 7½ days, by a route passing through Ireland and Newfoundland, and thence by the Intercolonial Railway from Shippigan, recently constructed to unite the "maritime provinces" with Canada and the United States. What the advantages of such a shortening of the sea passage would be will be judged from the incidents of Atlantic voyage given in the next chapter.

CHANGES IN FORM OF MARINE ENGINES.

Any one who is only familiar with the magnificent types of marine engineering now existing can form but a meagre conception of the slow steps by which the present degree of excellence has been attained. The contrast, for example, between the 'Comet' engine in the Glasgow Museum, and the 'compound engines' of a first-class Cunarder, marks the two poles of the progress of marine engineering. The alterations in the form and principle of the marine engine are too numerous to be noticed here in detail. Mr. Mayer, in his paper on *Glasgow and the Clyde Valley*, prepared for the British Association, furnishes a notice of 93 sets of engines built by a leading Clyde firm within the past twenty years, the following being the names of the kinds

of engines successively used :— “ steeple engines, diagonal engines, beam engines, side-lever engines, oscillating engines, geared steeple engines, geared beam engines, inverted direct-acting engines, compound inverted direct-acting engines, compound beam engines, compound diagonal engines, and compound oscillating engines.”

From the same volume we obtain the following Table, giving

EXAMPLES OF PROGRESSIVE CHANGES IN MARINE ENGINEERING
PRACTICE ON THE CLYDE SINCE 1829.

Kind of Vessel.	When built.	Tonnage.	Kind of Engine.	Horse-power, Nominal.	Flue or Tubular Boiler.	Pressure of Steam.
Paddle	1829	280	Side-lever	100	Flue-boiler	5 lbs.
„	1830	330	Direct	150	„	6 „
„	1832	385	Side-lever	180	„	8 „
„	1835	440	„	260	„	10 „
„	1838	564	„	260	„	14 „
„	1847	899	„	440	„	18 „
„	1853	490	„	244	Tubular.	20 „
„	1860	677	Oscillating	290	„	40 „
Screw.	1870	632	Compound	150	„	60 „
„	1873	914	„	212	„	65 „
„	1874	4535	„	600	„	65 „

The last vessel named is understood to be the ‘Bothnia,’ or its sister ship the ‘Scythia,’ which rank as two of the most magnificent vessels afloat.

Although the screw propeller does not appear in the above representative list till 1870, this method of propelling steam vessels was introduced more than thirty years before that date. In this, as in nearly every other invention connected with steam navigation, there is a dispute as to whom belongs the credit of first introducing or suggesting it. The germ of the idea is found in various proposals made in the course of the eighteenth century, and besides being described, theoretically, by several French engineers, James Watt, in a letter written by him in 1770, mentions the design of propelling vessels by means of a screw. Dr. Bushnell, in 1776, and Col. J. Stevens, in 1804, nearly gave America the credit of first practically solving the problem, and between that date and 1840, the names of Mr. Robert Wilson, Mr. Bennett Woodcroft, and Mr. Francis Pettit Smith, appear as projectors of the screw propeller. Mr. (afterwards Sir Francis) Smith, who took out a patent in 1836, was a farmer in the vicinity of London, who, giving his mind to mechanical pursuits, not only invented the ‘Archimedean’ screw propeller, but carried off the honours as being the first to apply

the screw practically and on a sufficiently large scale. In the company of Captain Ericsson, he, in 1837, exhibited on the Thames a small screw-steamer which towed a vessel of over 600 tons at $4\frac{1}{2}$ miles an hour against wind and tide. The invention was not finally delivered from the opposition it encountered till 1840, when the construction of the 'Archimedes,' of 232 tons burden, and engines of 80 horse-power, which was shown at the chief ports of Great Britain, finally set the question beyond cavil. Previous to this, Captain Ericsson, disappointed that the British Admiralty did not take up the invention, had gone to America, where he took a high place as a naval and marine engineer. In 1848 a remarkable trial of the relative merits of the screw and the paddle took place in 1845, when two ships of the British Navy, the 'Rattler' and the 'Alecto,' built on the same lines, and of the same horse-power, were tried against each other. It is the fact that, whether in light gales and in smooth water, or in heavy seas when gales were raging, the screw showed its superiority. On 3d April 1845 the vessels were lashed stern to stern, and the 'Alecto' (paddle) was allowed to get well under way. The 'Rattler' (screw) was then turned ahead, and in spite of all the efforts of her rival, the screw-steamer dragged off the paddle-steamer at two and a half knots an hour, though the paddles were kept hard going to resist her.

The relative cost is also much in favour of the screw, the paddle-ship costing about £5 per ton register more than the screw, and also costing more in the shape of current expenses. The engines also occupy more space. In those circumstances it is not to be wondered at that the paddle-ship should be now almost going out of use in the commercial marine, and entirely so in the navies of the world. The screw propeller has been the subject of progressive improvement since first introduced, but it would lead into details much too technical for such a work as this to endeavour to explain the merits of right and left handed screws, of high and low pitch, or of two, three, and four bladed screws. It is curious to remark how perfected inventions sometimes seem to bring us back to the form hit upon by the earliest adventurers in the track. Mr. Robert Griffiths, who has given much time to the study of the subject, has proposed to encase the screw, proving by experiment that to do so lessens the danger from fouling and wreckage, decreases vibration in the vessel, and also lessens the dangers of "racing" in the engines when the stern is lifted out of the water, and the screw flies round unimpeded. He has also proposed that a screw, both at bow and stern, should be provided in war vessels, within tunnels, hoping thereby to secure lighter draught of water for the same power, protection for the machinery, and more rapid powers

of turning, stopping, or going astern. The one proposal brings us back to the recollection of Symington's 'Charlotte Dundas,' the other to his earlier 'exemplification' on the Forth and Clyde Canal.

Remarkable as has been the advance made in the propulsion of steam vessels by the screw, that invention is however admitted to be still susceptible of great improvement. The "slip of the screw" has for a long period been deemed the opprobrium of marine engineering. By this is meant the loss of power which results in consequence of the water escaping from the blade of the revolving propeller—a loss frequently amounting to one-half of the effective progress which should result from the action of the screw in a given time. This drawback Mr. Robert Wilson, an engineer of Patricroft, in Lancashire, claims, by an invention newly made public, to have overcome. Its main feature is the arrangement of two screw propellers in such positions that the "slip" of the screw is totally counteracted, and even a negative slip obtained. To the merits of the invention is added the absence of vibration, so much complained of as one of the worst defects of the screw-steamer. The method adopted by Mr. Wilson is to place a second propeller directly behind the first and revolving in the opposite direction. A more perfect resistance is thus obtained for the propeller blades to act against than if the first motion of

the water had been allowed to go on unobstructed. Opposite actions are communicated to the propellers by having the shaft of the foremost propeller of large diameter and hollow, while that of the after one is solid and of a diameter to admit of passing within the large one. By ingeniously constructed gearing the shafts are then made to revolve in opposite directions. The "wash" from the screw is, like the vibration, said to be entirely counteracted. Mr. Wilson, who has filed letters patent to protect his invention, feels confident that with his double counteracting screws the voyage from Liverpool to New York will be reduced to six days—a consummation devoutly to be wished.

SAVING IN FUEL.

At the time of the war in the Crimea, when vessels for the coal trade to the Pacific became very scarce, and the coal therefore nearly doubled in price, the directors of the Pacific Steam Navigation Company called in Mr. Elder, of the firm of Randolph, Elder, and Company, Glasgow, to help them to solve the difficulty in the question of saving coal. Very shortly afterwards the double cylinder engine appeared, which was first applied to the ships 'Inca' and the 'Valparaiso,' the engines of the 'Inca' being started in May 1856, and the 'Valparaiso' in the July following. These compound engines were patented in March 1856 by Messrs.

Randolph and Elder, and have since been used most successfully in a long list of steamers.

The principle of this important invention may be thus described, that there are two diametrically opposite cranks and four cylinders, making a pair of compound engines. There are high and low pressure cylinders to each engine lying side by side in an inclined position, the pistons moving in contrary directions. By this arrangement a balance of the driving forces is promoted, and the steam passes from the high-pressure to the low-pressure cylinder in the most direct manner possible. The directions in which the cylinders lean are contrary, the forward engines inclining backwards, and the after engines forwards; or in the case of a screw-steamer, the starboard and port engines lean respectively to starboard and to port, and the piston-rods make with each other an angle which ranges from 60° to 90° in different engines. The result is one of the most compact and simple arrangements that is possible in a pair of compound engines, and it makes as near an approach to a balance of driving force as is practicable when each engine has two cylinders only.

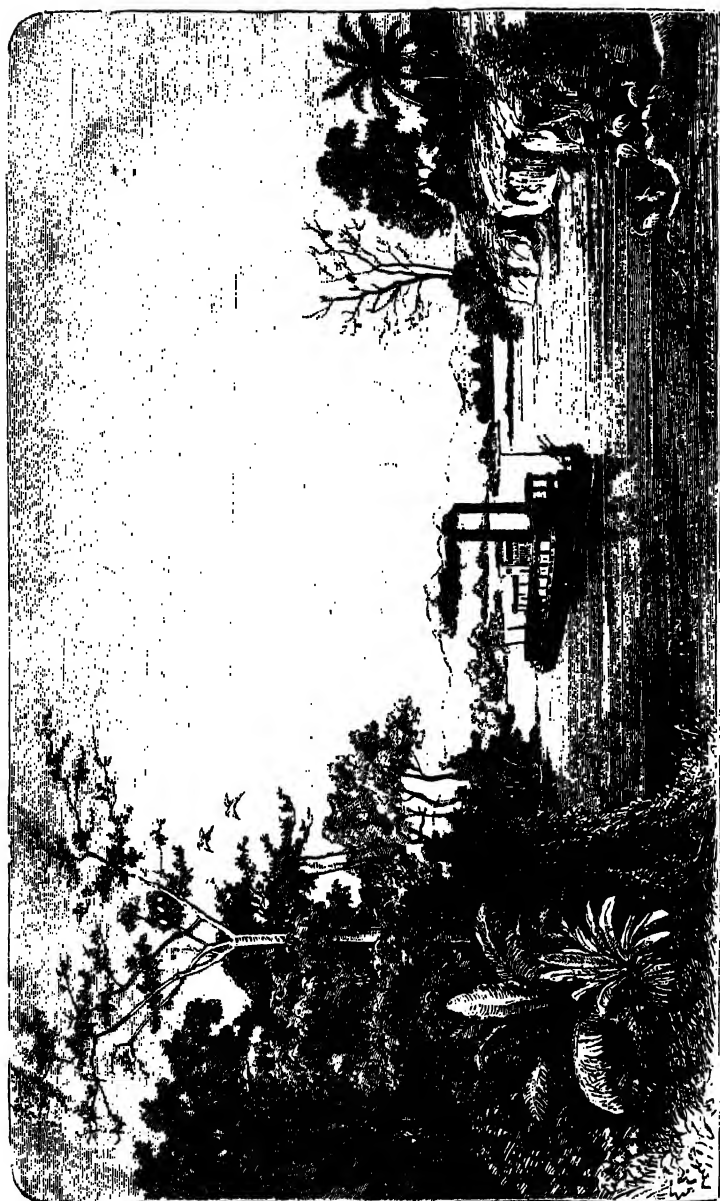
The consumption of fuel by the 'Inca' on its trial trip was $2\frac{1}{2}$ lbs., by the 'Valparaiso' 3 lbs. per indicated horse-power per hour—a degree of economy never before realised in marine engines, and this was not only obtained on their trial trips but ever after-

wards maintained. This result amounted to a saving of from 30 to 40 per cent of the fuel previously consumed by steamers of the same class, and it may safely be said that it was this saving which made it profitable to continue to carry on steam navigation on the Pacific Ocean. The firm by whom these important inventions were introduced, continued to carry out the same principles of engine-construction, the rates of consumption of fuel being gradually reduced to $2\frac{1}{2}$ lbs. and $2\frac{1}{4}$ lbs. per indicated horse-power per hour. When the compound marine engines were first introduced, the steam-pressure did not as a rule exceed 30 lbs. to the square inch. In the British Association Report, Oxford Meeting, 1860, it is said that the Pacific Steam Navigation Company had had the machinery, which was then only about seven or eight years old, removed from three of their large steamers, and replaced by the new compound engines. Not only were the steamers, when altered in this way, run at a much lower cost for fuel, but a space of about 30 feet amidships (or about one-eighth of the entire length of the vessel) became available for other purposes owing to the smaller space occupied by the engines and the less bulk of coal required to be carried.

A still more remarkable result in the way of re-casting a steam-fleet in consequence of altered circumstances is seen in the case of the Peninsular and Oriental

Company already alluded to. The great and deservedly popular "P. and O." was subjected about the same time to two necessities, a change of system and a change of style. The opening of the Suez Canal, besides, for example, revolutionising the tea trade with Europe, led to the establishment of many steam-packet lines between East and West, so that the "P. and O." were seriously threatened with the loss of their pre-eminence in this business. The new-comers could at once supply themselves with steamers fitted for the canal, and with the newest form of engine. To compete with them the Peninsular and Oriental Company had to revolutionise its steam fleet. The vessels fitted to carry the trade to and from the two ports of the Overland Route at the Isthmus of Suez had to be replaced by vessels fit to do the whole voyage, canal included. At the annual meeting of the company in December 1876, the chairman of the meeting gave some details of what this change meant, as between the ships of 1869 and the ships of 1876. In the former year the company had 46 steamers of a tonnage of 84,059 tons and 18,294 horse-power. The reorganised fleet consists of 48 steamers of a tonnage of 124,664 and 21,856 horse-power. "Many of the ships of 1869 had been admirably adapted for the purposes for which they had been originally designed, but they were quite inadequate for the great carrying trade called into

existence by the opening of the Suez Canal; while the progress of science and the introduction of the compound engine had tended to render the machinery of many of the company's ships obsolete." So it had become necessary to "get rid of twenty-one ships that had become obsolete, to build twenty-four large steamers, and to compound or reconstruct the machinery of fourteen more ships." This involved a capital outlay of £2,500,000. During the year the fleet of the company traversed 1,700,000 miles, and by its agency mails from India, China, Japan, and Australia, had, by converging lines at Point de Galle and Suez, been delivered in London every Monday morning with train-like punctuality. The company's ships during the year conveyed 300,000 tons of cargo, and 15,000 passengers, without loss of life, without serious accident, and without any maritime catastrophe. With some pride in such results the chairman boasted that "during the last thirty-six years the company had stood in the front rank of the maritime enterprise of the country," and declared his belief that neither the experience nor the trade gained during that time would now desert it, but that the mission of the company "had but just begun." To this organisation or that of the Cunard line no one desiring to quote a type of British enterprise, skill, and good management, whether by sea or land, need hesitate to turn.





CHAPTER IV.

Hurrah, hurrah for de ole steam boat,
Sailin' down de ribber like a meetin' house afloat.

Nigger refrain.

THE PLEASURES AND DANGERS OF STEAM NAVIGATION—"ACROSS THE ATLANTIC"—PERILS OF THE OCEAN—TERRIBLE ATLANTIC VOYAGES—THE FORFARSHIRE AND GRACE DARLING—THE BIRKENHEAD—AMERICAN RIVER STEAMERS.

THE PLEASURES AND DANGERS OF STEAM NAVIGATION.

"ON board a steamer," says the famous traveller, Madame Ida Pfeiffer, "everything is agreeable and luxurious; the vessel pursues her rapid course independent of the wind, and the passengers enjoy good and fresh provisions, spacious, cabins, and excellent society." The testimony of such a traveller is valuable as that of one who had "tried it both ways" like the Scotch advocate of honesty, and had travelled over a great part of the world amidst all the delays, the inconveniences, and the dangers of a sailing vessel. Except to the captain and crew of such a vessel, a voyage by sea without steam is almost unknown in our day, and year by year the proportion of vessels aided in their progress by this powerful agent is on the increase. To one for whom the dreaded *mal de mer* has no terrors, there is probably no greater enjoyment than a lengthened steamboat voyage in favourable weather. "A floating palace, sur-

rounded with all the conveniences and luxuries of a splendid hotel," is the description of one enthusiastic writer, and though there is a reverse to the picture, in the records of storm and disaster, there have been few inventions of man which have added so materially to the sum of human enjoyment as the development of steam navigation. The "Autocrat of the Breakfast Table" has expressed something of the joyful feeling with which one who is a good sailor can enter into the spirit of such a voyage in the following stirring lines:—

See how yon flaming herald treads
The ridged and rolling waves,
As, crashing o'er their crested heads,
She bows her surly slaves!

With foam before and fire behind,
She rends the clinging sea,
That flies before the roaring wind,
Beneath her hissing lee.

The morning spray, like sea-born flowers,
With heaped and glistening bells,
Falls round her fast, in ringing showers,
With every wave that swells.

And burning o'er the midnight deep,
In lurid fringes thrown,
The living gems of ocean sweep
Along her flashing zone.

With clashing wheel, and lifting keel,
And smoking torch on high,
When winds are loud, and billows reel,
She thunders foaming by.

When seas are silent and serene,
With even beam she glides,
The sunshine glimmering through the
green,
That skirts her gleaming sides.

Now, like a wild nymph, far apart
She veils her shadowy form,
The beating of her restless heart
Still sounding through the storm.

Sam Slick is, however, of a very different opinion :—

"Well," says I, "as I was a sayin', Captain, give me a craft like this that spreads its wings like a bird, and looks as if it was born, not made, a whole-sail breeze, and a seaman every inch of him like you on the deck, who looks you in the face, in a way as if he'd like to say, only bragging ain't genteel, Ain't she a clipper now, and ain't I the man to handle her? Now this ain't the case in a steamer. They ain't vessels, they are more like floating factories; you see the steam machines and the enormous fires, and the clouds of smoke, but you don't visit the rooms where the looms are, that's all. They plough through the sea dead and heavy, like a subsoiler with its eight-horse team; there is no life in 'em; they can't dance on the waters as if they rejoiced in their course, but divide the waves as a rock does in a river; they seem to move more in defiance of

the sea, than as if they were in an element of their own.

"They puff and blow like boasters braggin' that they extract from the ocean the means to make it help to subdue itself. It is a war of the elements, fire and water contendin' for the victory. They are black, dingy, forbiddin' looking sea monsters. It is no wonder the superstitious Spaniard, when he first saw one, said, 'A vessel that goes against the tide, and against the wind, and without sails, goes against God;' or that the simple negro thought it was a sea devil. They are very well for carrying freight, because they are beasts of burden, but not for carrying travellers, unless they are mere birds of passage like our Yankee tourists, who want to have it to say I was '*thar*.' I hate them. The decks are dirty; your skin and clothes are dirty; and your lungs are foul; smoke pervades everythin', and now and then the condensation gives you a shower of sooty water by way of variety that scalds your face, and dyes your coat into a sort of pepper-and-salt colour.

"You miss the sailors, too. There are none on board—you miss the nice light, tight-built, lathy, wiry, active, neat, jolly crew. In their place you have nasty, dirty, horrid stokers; some hoisting hot cinders, and throwing them overboard (not with the merry countenances of niggers, or the cheerful sway-away-my-boys expression of the Jack Tar, but with sour, Cameronian-lookin' faces, that seem as if they were

dreadfully disappointed they were not persecuted any longer—had no churches and altars to desecrate, and no bishops to anoint with the oil of hill-side maledictions as of old); while others are emerging from the fiery furnaces beneath for fresh air, and wipe a hot, dirty face, with a still dirtier shirt sleeve, and in return for the nauseous exudation, lay on a fresh coat of blacking; tall gaunt wretches who pant for breath as they snuff the fresh breeze, like porpoises, and then dive again into the lower regions. They are neither seamen or landsmen, good whips nor decent shots; their hair is not woolly enough for niggers, and their faces are too black for white men. They ain't amphibious animals, like marines and others. They are salamanders. But that's a long word, and now they call them stokers for shortness.

"Then steamers carry a mob, and I detest mobs, especially such ones as they delight in—greasy Jews, hairy Germans, mulatto-looking Italians, squalling children, that run between your legs and throw you down, or wipe the butter off their bread on your clothes; Englishmen that will grumble, and Irishmen that will fight; priests that won't talk, and preachers that will harangue; women that will be carried about, because they won't lie still and be quiet; silk men, cotton men, bonnet men, iron men, trinket men, and every kind of shopmen, who severally know nothing in the world but silk, cotton, bonnets,

iron, trinkets, and so on, and can't talk of anythin' else; fellows who walk up and down the deck, four or five abreast when there are four or five of the same craft on board, and prevent any one else from promenadin', by sweepin' the whole space, while every lurch the ship gives, one of them tumbles atop of you, or treads on your toes, and then instead of apologisin', turns round and abuses you like a pickpocket for stickin' your feet out and trippin' people up. Thinkin' is out of the question, and as for readin', you might as well read your fortune in the stars."

All this merely expresses in the rough tongue of the New Englander, the same opinion as is put in other words by Mr. Ruskin, that "a ship under full sail is one of the loveliest things man ever made, and one of the noblest; nor do I know any lines out of divine work so lovely as those of the head of a ship . . . a broad strong sea boat, able to breast a wave and break it." Whatever their commercial advantages, it must be admitted that the long black steamers—irreverently called gas-pipes, coffins, or floating flat-irons,—cannot be said to walk the waters like a thing of life.

"ACROSS THE ATLANTIC."

Many writers have placed on record the incidents of an Atlantic voyage in one of the ocean steamers, and it would not be difficult to gather together a large volume of such narratives. Choos-

ing one of the latest—from the pen of a Scotch journalist visiting “The Centennial” at Philadelphia—we are enabled to present the following attractive picture of the journey in its holiday or fine-weather aspect:—

“Life on the ocean wave, as passed on board a first-class steamer on the great steam-ferry between Liverpool and New York, may be best understood by conceiving a first-class hotel made to float, and propelled through the water by steam engines and screw at the rate of from 300 to 450 miles a day. It is like a hydropathic establishment shipped off to sea without any change of inmates for ten days, and with beer, brandy, and cigars *ad libitum*. Different from most hydropathic institutions, the living is too luxurious—two very heavy meals, breakfast and dinner, with a light intermediate lunch, which alone is about equal to two ordinary dinners. Then there are all manner of diversions for the lively, of associates for the companionable, and of books for the studious. Unless a man is very dull or very sick, time will not hang on his hands. I am glad to say that I have been neither sick nor dull, and generally surprised how short the days and quick the passage has seemed.

“I selected a White Star liner, partly for speed, but chiefly on account of the good sense of the builders in abandoning the old-fashioned arrangement of placing the cabin and berths in the stern,

abaft the engines and over the screw—an arrangement which converts the ship into a factory of sickness, by subjecting the passengers to the greatest motion, the worst smells, and the most excruciating dins. The White Star has been to other steam packet lines what the Midland has been to other English railways—the great innovator and improver, with the result that I have been hearing all the way over from experienced travellers of the numerous points of comfort in which our ship excels others in which they have crossed previously. The main advantage is the position of the saloon in midships, ahead of the cooking galley and the engines, so that none of the odours, or rather mal-odours, of the cookhouse and the engine-room enter the cabin. Then there are a number of staterooms before the saloon—still farther removed from the screw—and the ship is of such length, and the engines work with such extraordinary smoothness, that in our vessel, the ‘Celtic,’ we sometimes could hear neither the one nor the other, and appeared to be in a sailing vessel. The saloon itself, in all respects except height, compares favourably with the dining-rooms of the best London hotels. Upwards of 50 feet long and 40 feet in width, it admits of four large tables, seating comfortably 140 persons at each meal. It is lighted by twenty-four uncommonly large ports—twelve on each side—has a large library, a piano-

forte, two marble mantelpieces, and numerous mirrors ; but chiefly surpasses in what is the weakest point in most cabins—ventilation—currents of fresh air always passing through the doors at each end, and upwards through two ventilating shafts. In the same way the staterooms and bed cabins are superbly ventilated. The wooden partitions are not carried up to the top, but kept nearly a foot below the ceiling, and from all the passages air-shafts are carried to large funnels above, thus causing a continual circulation of fresh air day and night in all weathers. This system prevents you being saluted when you go below by that abominable ‘smell of the ship,’ which commonly turns the stomach of the passenger long before any storm arises. As showing how much comfort and convenience are studied, I may add that each state cabin has its electric bell ready to summon steward or stewardess. There is a barber’s shop, with all hair-brushing and shampooing appliances. There are several bath-rooms. The ladies have their own boudoir, and the gentlemen their smoking-room, airy and luxuriously fitted. There is a nursery for children, and separate rooms for both male and female servants. Nothing, in fact, seems to be lacking that ingenuity can devise, and while the accommodation is spacious not an inch of room is wasted.

“Electricity, steam, and water are conveyed by their several veins

and arteries all over the ship. Soon after the passengers were carried on board in a large tender, and their luggage in another, the anchor was heaved noiselessly by a steam windlass, and the engines going dead slow, our voyage began, the ship gliding away while most of the passengers were unconscious of motion. The appearance of Liverpool with its crowded docks, and of the Mersey with its numerous ocean steamers anchored in the stream, gave one a farewell impression of the magnitude of the English shipping interest ; and in steaming down the river with two other large steamboats and meeting a small fleet of sailing vessels coming up the river, one cannot but commend the Mersey Trust for the splendid manner in which, by floating lights and lighthouses on shore, the river is lighted almost like a street. Although our steamer is 450 feet in length—a walk six times up and down her deck being a mile—she is steered as easily as a yacht. The wheel is at least 250 feet from the rudder, but is moved almost by the touch of a finger, the power being supplied by steam. The signals from the bridge to the engine-room are all given by electricity. Everywhere on board we see the practical utility of science. Its latest development has been in the construction of a huge meat safe on board for bringing over 100 tons of American beef every passage from New York. The ‘Celtic’ brought this quantity on her last trip, and delivered it

in perfect order in the middle of summer, so that there need be no fear for the winter supply. This safe is coated all round with zinc, and the meat is hung all through it from hooks; a small steam-engine above works a fan which causes a continual circulation of fresh air. There are now eight steamers weekly between America and England, so that if each brought 100 tons there would be 800 tons of beef added to the supply of the English market. Were each vessel to bring 200 tons, the total of 1600 tons would considerably modify the price, as it can be brought over for somewhat less than $\frac{1}{2}$ d. per lb. freight. There seems no reason why good American beef should not be sold in the English market at about 8d. per lb.

“Writing of the preservation of beef, one of the most surprising

things on board one of these steamers is the freshness of all the provisions throughout the voyage. I am writing when we are on the banks of Newfoundland, and yet everything—including butter, eggs, fruit, and vegetables—tastes as fresh as if it had just come from the market. The abundance, the superabundance, and the embarrassing variety of good things—all as good as can be got at the best hotel on shore—are astonishing. There are hot rolls and cakes fresh from the oven every morning—hot rolls in the English, and corn bread, hominy, and rice cakes in the American styles. The cooking altogether is nearly perfect, and the service by the waiters most attentive and accommodating. As certifying that there is no danger of starving on board these ships, I give here one or two of our Bills of Fare:—

BREAKFAST.

Beef Steak and Onions. Hashed Calves' Head.
Liver and Bacon. Broiled Ham and Eggs.
Omelettes and Mutton Chops. Findon Haddies.
Fried Fresh Fish. Grilled Sausages. Rice Cakes.
Devilled Bones. Corn Bread. Porridge.
Digby Herrings. Irish Stew.
Mashed, Chopped, and Jacket Potatoes.

DINNER.

SOUPS.
Pea and Giblet.

FISH.
Haddock and Anchovy Sauce.

ENTREES.
Veal Cutlets a la Zingara. L'Amour en Masque.
Ox Tail a la Jardiniere. Curried Mutton and Rice.

ROAST.
Rib of Beef and Potatoes. Leg of Mutton and Onion Sauce.
Loin of Pork and Apple Sauce. Ducks and Green Peas.
Spring Chicken and Bread Sauce. Ox Head Forced.

BOILED.

Rabbits and Bacon. Turkey and Oyster Sauce.
Pork and Beans Baked.

COLD.

Ham and Tongue.

VEGETABLES.

Parsnips. Green Peas. Mashed and Boiled Potatoes.

PASTRY.

Gooseberry and Bread and Butter Puddings. Apples.
Hedgehog., Vol au Vent of Rhubarb. Compot of Pears.
Chocolate Creams. Sweet Sandwiches.
Nelson Cakes and Marmalade Tartlets.

CHEESE.

Stilton, Wiltshire, Cheshire.

DESSERT.

Oranges, Apples, Prunes, and Nuts assorted.
Tea and Coffee.

"At eight o'clock in the morning the warning bell rings for breakfast, which begins punctually at half-past; lunch is at one, and dinner at six o'clock. In the intervals, 'wind and weather permitting,' the majority of the passengers sit or promenade on the upper deck, where time goes rapidly in making up sweepstakes on the speed of the ship, which are settled at mid-day, when the speed is posted up, and marked down on the pocket charts; in watching passing vessels; playing at rope quoits; or helping the youngsters to fly kites. The deck presents a succession of human dissolving views, which scarcely ever remain two minutes alike. There is the neat, close-shaven, silent, solitary man, who always paces the deck alone, speaking to nobody, nobody speaking to him; the loud-talking youth, whose voice is heard wherever you go; the broad-set, phlegmatic person,

who waddles slowly along; the dark Canadian, always dolefully ruminating over his bilious condition; the stout lady, who seems to live and sleep stretched out on her easy chair; the doting young husband who never leaves the side of his wife; the gallant young gentleman who makes himself agreeable to all the young ladies in turn; half-a-dozen ladies, in miscellaneous wraps, who seem to be reading through all the novels in the ship; the man with the red smoking cap, the man with the green smoking cap, and the man with the blue smoking cap; the handsome Captain, who smokes his cigar with the style of an Admiral; the old Scotchman, whose features bespeak his early acquaintance with oatmeal porridge; the placid Missourian lawyer, full of law, science, and statistics, whose grandparents were German and English on one side and Welsh and Scoto-Irish on the other; the com-

placent Doctor from Tennessee, born in Hungary, who has just been visiting his native country but does not like it; the smart mulatto and the negress, with her anxious smiling face, whose lips and nose remind one of Pio Nono's greeting to a black Bishop, 'My brother, how ugly you are;' the little fat boy riding in a chair converted by his sister into a miniature carriage, in which she sometimes airs her doll; and the sudden racing, laughing, and shouting of children all round the ship. After being several days at sea some people come on deck who were previously unseen, and who appear to have been passing their time like Jonah in the whale's belly.

"In crossing the Atlantic we have experienced a little of several kinds of weather. We began with the wind right ahead, continuing for three days, and ending in a close approach to a gale; then we had an exceedingly fine day and lovely moonlight night; then twenty-four hours of fog, the steam horn bellowing sometimes every half-minute like a gigantic sea-cow in distress, and with the excitement of passing very closely, in the thickest of the fog, a large ship, which was also blowing her horn; then suddenly passing from the fog into the clearest moonlight again, and approaching the western coast with a foresight of the unclouded American sky.

"The nights to a sound sleeper like myself as we go west have a novel charm—the clock is put

back half an hour at midnight, and thus we gain nearly five hours extra sleep during the passage. I love the lullaby of the waves, which sound like the rustling of the leaves of a mighty forest, and although the glimpse of the moonlight through the port window tempts to wakefulness, it is pleasant to slumber to the music of the ocean, varied only by the sound of the boatswain's pipe, the distant singing of the sailors as they hoist the sails to catch a favouring breeze, the half-hourly ringing of the ship's bells, and the answer of the man on the watch that "All's well." The "shanty" man who leads the singing of the sailors when they go round in a gang washing the decks commonly improvises a song on passing events. Last night I caught the couplet—

'Now the 'Chester' leads the way,
But we'll pass her by break of day.'

There was then some allusion to arriving at New York. And later on—

'We shall sail for Liverpool town,
That great place of vile renown.'

After each couplet the gang join in a plaintive kind of chorus, reminding me of songs I have heard sung by the monks at night in Italy. The 'Chester' alluded to in the song was a large steamer which left Liverpool about a quarter of an hour before us, and reached Sandy Hook about a quarter of an hour after us. She was detained, however, two hours longer than we at Queenstown, to

get the mails on board. She passed the 'Celtic' during a fog about the fifth day out, and when the fog rose we saw her a considerable distance ahead of us. She kept ahead two days, when we passed her during the night, and led her all the way to New York. The race afforded considerable interest to the passengers.

"On the last night before sighting the Western Continent, the steward and cook surpassed their former achievements in the way of dinner, and there was great fun and hilarity afterwards. Next morning all were early astir to get the first sight of land. It was lovely weather, and crowds of coasting vessels, yachts, fishing and pilot boats, betokened our approach to a civilised country. At a distance the coast of Jersey looks like a well-wooded part of England; but on approaching it we see that the trees are pines of natural growth. The villas are all very trimly kept, and what first strikes one is the settled, established appearance of everything. Clifton, off which we anchor a short time for the Health Officer's inspection, has a handsome church, with steeple and spire, and the tolling of the bell has quite a Sabbath sound. Nestling among trees all along the rising ground on both sides of the Narrows are charmingly situated residences. A slight haze somewhat intercepts the view of New York, but we pass numerous excursion steamers gaily draped with flags—that of the United States being generally of

enormous size—while some are dressed out with smaller banners all round the bulwarks. One or two of the sea-going steamers are very stately—with two or three tiers of saloons, the beam engine working in the centre, the steering wheel far forward, bands of music playing under cover, and large crowds of passengers on the decks. We next descry what appear two huge steeples, something like the Victoria Tower at Westminster, and learn that these are the piers of the Brooklyn Suspension Bridge, which is to have a span of 5862 feet. The steeples and spires of Brooklyn and then those of New York come into view, but the loftiest, largest, and most conspicuous buildings are the *Herald* and *Tribune* newspaper offices, indicating the position which the press has acquired in the States. We now glide past the wharves of numerous Atlantic Shipping Companies—British, French, German, etc.—till at last we sight our own and the Cunard landing-places. The accommodation is the best anywhere seen. Enormous steamers of from 3000 to 5000 tons steam direct into their own docks, and the wharves are completely covered by sheds which will hold their entire cargoes. There is an arrangement in New York by which, as soon as a steamer is sighted at Sandy Hook, telegraphic messages are sent out to persons in New York having friends on board, informing them when she may be expected at the quay."

The editor of a well-known news-

paper, whose narrative we have quoted above, is so enthusiastic on the subject of meals on board a steamer, that, as a *per contra*, we give Sam Slick's view on the subject, drawn, like the previous extract from a work by the same lively writer, entitled *Nature and Human Nature* :—

"The bell comes in aid, and summons you to dinner. Ah, the scene in the Tower of Babel is rehearsed ! What a confusion of tongues ! what a clatter of knives, and forks, and dishes ! the waiter that goes and won't come back ; and he who sees, pities, but can't help you ; and he who is so near-sighted he can't hear ; and he who is intercepted and made prisoner on his way.

"What a profusion of viands—but how little to eat ! this is cold ; that underdone ; this is tough ; that you never eat ; while all smell oily : oh, the only dish you did fancy, you can't touch, for that horrid German has put his hand into it ! But it is all told in one short sentence : two hundred and fifty passengers supply two hundred and fifty reasons themselves why I should prefer a sailing vessel, with a small party, to a crowded steamer. If you want to see them in perfection, go where I have been, on board the California boats and Mississippi river craft. The French, Austrian, and Italian boats, are as bad. The two great ocean lines, American and English, are as good as anything bad can be, but the others are all abominable. They are small worlds over-

crowded, and while these small worlds exist, the evil will remain ; for, alas ! their passengers go backward and forward ; they don't emigrate—they migrate ; they go for the winter, and return for the spring ; or go in the spring and return in the fall."

PERILS OF THE OCEAN.

The records of disaster to steam vessels are so numerous—and sad it is that we should have to say so—that we cannot attempt even an enumeration of the chief incidents of that nature. In ocean travelling, but too often have Byron's words been realised, and the stormy waters of the Atlantic, or the rocky shores on both sides, have many secrets hid away of which no record exists ; for from the days of the ill-fated 'President' down to this time, a series of magnificent ships have simply failed to reach their destination, and their fate, though it may be conjectured, cannot be narrated—

Her mighty sails the breezes swell
And fast she leaves the lessening land,
And from the shore the last farewell
Is waved by many a snowy hand ;
And weeping eyes are on the main,
Until its verge she wanders o'er ;
But from the hour of parting pain,
That bark was never heard of more !

When on her wide and trackless path
Of desolation, doomed to lie,
Say, sank she 'midst the blending wrath
Of racking cloud and rolling sea ?
Or where the land but mocks the eye,
Went drifting on a fatal shore ?
Vain guesses all—her destiny
Is dark—she ne'er was heard of more !



Oh ! were her tale of sorrow known !

'Twere something to the broken heart,
The pangs of doubt would then be gone,
And fancy's endless dreams depart ;
It may not be ! there is no ray
By which her doom we may explore ;
We only know she sailed away,
And ne'er was seen or heard of more.

In most cases of the wreck of an ocean steamer, however, some part of those on board have survived to depict the scene, and to recall the terrors of their hairbreadth escapes :—

Then rose from sea to sky the wild
farewell—
Then shrieked the timid, and stood still
the brave ;
And some leaped overboard with dread-
full yell,
As eager to anticipate their grave.
Then all was hushed,
Save the wild wind and the remorseless
dash
Of billows ; but at intervals there
gushed,
Accompanied with a convulsive splash,
A solitary shriek, the bubbling cry
Of some strong swimmer in his agony.

From amidst a number of stirring narratives in which the vessel, while encountering all the fierceness of an Atlantic storm, have

yet succeeded in bringing every life to shore in safety, the following may be given. In one case the passengers had the reckless conduct of the captain to encounter as well as the wrath of the storm ; and though happily such exhibitions of foolhardiness on the one hand and disaffection on the other are rare, the account will serve to illustrate that something more than the spirit of the storm may be abroad to increase the terrors of such an adventure :—

TERRIBLE ATLANTIC VOYAGES.

“On the same day on which the ——— sailed from Liverpool (30th September) there were three steamers belonging to opposition lines to start, and there appeared to be a mutual understanding (so say the passengers) among the captains that the voyage between the three steamers should be looked upon as a Transatlantic race, with a proviso, as was generally understood, that the ——— was to be the first in at New

York. The story of the voyage is best told in the language of one of the cabin passengers, which may be taken as a general sample of what is related by others. This gentleman says—‘We had probably gone about 200 miles from Queenstown when the wind increased to a gale and the sea rose mountains high, sweeping the deck fore and aft as each wave struck us on the bow. We were at the time driving at full speed, and while we sometimes rode over the seas, we more often cut through them, receiving the full force of the shock of tons of water dashed on the upper deck and against the sides. Still the speed was maintained, and we must have been going at a rate of fully twelve knots an hour. The gale seemed to increase in fury, if possible, and the ship was unable to rise to the waves, but buried her stem at each pitch, receiving as she did so each time sounding and telling blows on her forward deck, which shook her timbers from bow to stern, and making her shiver as though at each next successive shock she must fall to pieces. Among the women, as can readily be supposed, there was the greatest consternation. The captain was called upon to listen to the remonstrances of the passengers, but he persistently refused to take any heed of the prayers made to him to return. All night he still kept on meeting and receiving the full force of the seas, and as the morning (Saturday) broke, the forward portion of the

deck, by the continued pounding of the waves, was stove in, and the water rushed down into the hold as each sea broke over the ship. The saloon and staterooms were flooded on the lee side, and it was found that all the lower compartments were filled with water. The pumps were set going, but they were constantly becoming choked with portions of the cargo and baggage which had become loosened, in the shape of feathers, bagging, and other matter, and were consequently of but little use. In spite of every argument that could be presented, the captain still kept on his course, and at very nearly the same speed. Finally, however, the ship was laid to, and for several hours attempts were made to set matters straight, after which the captain again resumed the voyage at a rate of about four knots an hour. The crew—viz. the sailors, engineers, firemen, and others—had by this time begun to realise the situation. They gathered together in twos and threes, and shortly after came to the conclusion that it would be not only unwise and dangerous, but foolhardy, to proceed on the voyage of yet 2700 miles in the then condition of the ship when there was a port to be made by returning, which was only a day or a day and a half sail off. They therefore refused to work unless the ship was headed back for the port so shortly left. The captain was undecided what to do, and at first tried to intimidate the men, saying, ‘Well, I can afford to lay

here for a week ; let the fires go down and drift around.' Neither party appeared to be willing to make a concession, and we lay rolling and pitching in the trough of the sea, waiting, 'Micawber' like, for something to turn up in the shape of an agreement ; but for over half a day nothing was gained. The crew even went so far as to speak of getting out the longboat. The passengers were becoming despairing. Night was again approaching, and the sea once more appeared to be increasing instead of abating. Then, too, the attitude of the crew was adding increased anxiety to the officers and passengers. Finally, the passengers held a formal meeting, and adopted the following note to the captain :—

"Sir—We beg leave to submit to you the following considerations :—First, the crew refuse to do duty ; second, the vessel herself has eighteen feet of water in her hold ; third, the drinking water has become contaminated, and its use is deleterious ; fourth, we are only 300 miles from Queenstown. In view of these considerations, while earnestly expressing our confidence in yourself and your officers, we ask you to return at once to Queenstown.

"The captain, in answer to the committee which presented the above, replied that he felt inclined to give the crew another chance to resume their duty, but that, if they still refused, he should feel it incumbent on him to return to Liverpool or Queenstown. An hour or so elapsed, and it being found that the men were still as determined as ever not to proceed, the steamer was at last headed

back, much to the relief and satisfaction of every soul on board. The ——— arrived in the Mersey on Wednesday morning, but still, even at her dock, was compelled to keep the pumps going. An examination showed that the iron plates which covered the forward deck were broken by seas as though they had been simply matchwood. On arrival in port the passengers became extremely anxious in regard to their baggage. It was found to be all mixed up, smashed, and floating around in the hold. It was only by the most persistent fishing that any articles could be recovered. On application to the company for compensation for the losses sustained, the only answer received was that 'they could do nothing for us beyond forwarding us to New York.' During our voyage out here we have had time to consider and discuss the causes of the troubles we had to undergo, and it appears to be the general opinion that the vessel was driven at too great a speed in the heavy seaway in order to accomplish a quick passage ; that the captain and officers had not sufficient command over the crew ; that during the four hours of the Friday night, when the storm was raging at its worst, the fourth officer, whose watch it was, was asleep in the wheelhouse, instead of attending to his duty ; that the crew had no confidence in their officers, and that the ——— is of peculiar build, and is unseaworthy. There were many other reasons

for the disaster advanced, but these are the most likely to be real."

A different report of the conduct of the captain and crew is given in regard to a remarkable voyage of the 'Ethiopia,' consequent upon the breaking of her screw-shaft in mid-ocean, in the month of September 1875. In this story, not only bold and careful seamanship, but a prompt and daring struggle with great engineering difficulties were displayed.

"The 'Ethiopia,' one of the best and fastest steamers of the magnificent fleet sailing under the flag of the 'Anchor Line,' left Greenock, under command of Commodore Craig, on Saturday, 4th September, and stopped at Moville on the following day. When she left that port she had on board 140 cabin and 182 steerage passengers, and a crew of about 100 men. For some days the weather, though not agreeable, was light, until the 10th, when the wind was blowing a gale and the sea running high. As night fell the wind subsided, and on the morning of the 11th the sea was comparatively quiet. It was at that time that the accident happened which caused the vessel's detention. About six in the morning the passengers were startled by a shock which thrilled through the ship from stem to stern, and on inquiry it was found that the shaft was broken. The 'Ethiopia' at this time was about 250 miles from Nova Scotia, and 1200 miles from New York. An

examination revealed the fact that the break was a diagonal one, about fifty-four feet from the propeller, and about 20 inches long. A consultation of officers was held to discuss the three alternatives: that of returning to Queenstown, a distance of nearly 1600 miles, under sail; of attempting to proceed under the same disability to St. Johns; and that of repairing the shaft. The second was at once thrown aside as impracticable on account of the head winds and the danger of approaching the coast in their disabled condition. The first was repugnant to all, from the uncertainty of the time likely to be required to reach the south coast of Ireland. The third, though evidently very difficult, was declared feasible by chief engineer James Murray, and the consultation resulted in its adoption. The weather became very calm, and the entire force of engineers was soon hard at work repairing the shaft. To appreciate the undertaking of a work of this kind in the middle of the Atlantic, some technical explanations are necessary.

"In order to work on the broken part to advantage and to release the propeller, so as not to retard the sailing of the ship, it was found necessary to disconnect the length of shafting next to the propeller. It was then discovered that this part of the shaft had been badly sprung, being $2\frac{1}{2}$ inches off the centre. This was one of the greatest difficulties the

engineer had to contend with. No hollow place or perceptible flaw was discovered at the fracture, but the iron did not seem to be perfectly homogeneous. On one side of the break it appeared blacker than on the other, and, as was discovered on boring the shaft, one of the fractured parts was much harder than the other. The broken length was raised by means of a jackscrew, and the ragged edges were smoothly bevelled off and brought together. A four-inch hole was then bored right through the broken parts. This was a work of much labour. It had to be done in the low tunnel which surrounds the shaft, the men working entirely by lamplight, in every imaginable position, in a close atmosphere, their eyes almost blinded at times by the smoke from their lamps. Of course no machine drill could be introduced. The entire work of drilling this four-inch hole, and subsequently other holes in the coupling, had to be done with a hand-ratchet. A $1\frac{1}{4}$ inch hole was first bored. This was enlarged to three inches, and by a third boring to four inches. To bore this hole and fit a bolt to it took about three days. The break being only twenty inches long, admitted only one bolt. Four steel 'drivers,' four inches long and $1\frac{1}{4}$ inch broad, and three-quarters of an inch thick, were sunk into the shaft, flush with its surface, just across the line of fracture, serving to bind the two parts more closely together. A still worse difficulty

presented itself in the springing or bending of the shaft. Three men, with all the power they could get out of a jackscrew, were not able to reduce the part which was bent more than a quarter of an inch. So badly bent was the length of shaft back of the break that it was found impossible to couple them together as before. The old holes in the coupling would not correspond, and three new holes, three inches in diameter and five inches through, had to be bored through the couplings. Two of the bearings and plumber-blocks under the shaft were broken, and a new support had to be devised. The work was carried on night and day, and after eight and a half days the job was complete.

"While this was going on the steamer sailed and drifted about 400 miles, and on the engines being again got to work seven or eight knots an hour were made. The end of the difficulty had not, however, yet come. On the 23d September the four-inch bolt used in repairing the shaft broke, and another delay was necessary in order to replace it. Finally, making 160 nautical miles a day, the 'Ethiopia' reached Sandy Hook on Saturday night, and passed up to her moorings at the Anchor Line dock.

"As the vessel was passing Sandy Hook, the passengers held a meeting and adopted the following resolutions :—

"Whereas the Anchor Line steamship 'Ethiopia,' on the 11th of Sep-

tember 1875, on the sixth day out from Glasgow, in latitude 46.31, longitude 46.42, about 1200 miles from New York, was, by the breakage of her propeller shaft, totally disabled in her machinery and prevented from proceeding on her voyage: And, whereas, under the direction of her captain and through the extraordinary skill and untiring labours of the engineer and his assistants for nine days and nights, favoured by a providentially quiet sea, this serious damage was successfully repaired, so that the steamer was enabled safely to complete its voyage:

"Resolved, 1, Therefore that, acknowledging with devout gratitude the love and preserving care of our Father in Heaven, we desire to express to Captain James Craig and his officers our heartfelt thanks and high esteem for the coolness, wisdom, and judgment evinced during the necessary delay for repairs, and further, for their personal kindness, courtesy, and invariable attention to the comfort and welfare of the passengers.

"2. That we recognise with gratitude the judgment, skill, and perseverance, of the Chief Engineer, James Murray, and his associates in accomplishing, by the repairing of the shaft under extraordinary difficulties and with limited appliances, what must be regarded as a wonderful mechanical achievement, and we heartily commend them to the attention of both owners and underwriters.

"3. That copies of the foregoing resolutions be engrossed and presented on our behalf to Captain James Craig and Engineer James Murray.

"4. That we tender our hearty thanks to the Steward and Purveyors of the vessel for the ample and varied supply of food, maintained to the end of the voyage, prolonged to twice its usual length."

The *Scottish American Journal*, in recording this story, says—

"Perhaps no similar mark of respect and gratitude was ever

more richly deserved. What is, of course, of most general interest is, that an accident of the kind could be successfully coped with in the middle of a Transatlantic voyage. We believe that it has been left to Scottish engineering and Scottish seamanship to demonstrate that a shaft of fifteen inches can, by dint of skill and patience, be repaired at sea, and that, therefore, the dangers of navigation are to that extent the less. The repairing was, in its way, a triumph of engineering skill won under difficulties of the gravest kind. Won, however, it was, and Captain Craig and Mr. Murray are fully entitled to the respect not only of their passengers but of the travelling public.

"Among the passengers were many Scotch residents in this country. On their arrival they were, no doubt, met with more enthusiasm and feeling on the part of their friends than is usually exhibited on the occasion of a return from a visit to Europe. There was, beyond question, something calculated to induce anxiety in the prolongation of a voyage to three weeks, which has been done by the same vessel in a little more than one. But, after all, the anxiety shown was never great. This fact is to be attributed in part to the information brought by the 'Maas' (which spoke the disabled ship in mid-ocean) partly to the well-known ability of Captain Craig, and the efficiency of the other officers, and partly to the confidence in the

staunchness of the vessels comprising the Anchor Line fleet."

THE 'FORFARSHIRE' AND
GRACE DARLING.

One of the earliest recorded disasters to a steamer has also become the most famous, because of being associated with the name of a girl, Grace Darling, daughter of William Darling, lighthouse-keeper on the Fern Islands, whose noble deed has for forty years been remembered as one of great daring. The Fern Islands, lying off the coast of Northumberland, are twenty-five in number. The sea dashes with great force between the precipitous rocks of which the islands are composed, and sweeps the loose rocks about with a grinding noise. On the dark trap-rock is seen no vegetation—all is bare and desolate. The only living animals on the islands are flocks of gulls and other sea-birds; and the iron shore is covered with limpets. The swift currents running between the bare rocks leave no room for escape to any ill-fated vessel which may be caught in the swirling eddies. Of Longstone, the island on which stood the lighthouse occupied by Darling, Mr. William Howitt says—"It was like the rest of these desolate isles, all of dark whinstone, cracked in every direction, and worn with the action of winds, waves, and tempests since the world began. Over the greater part of it was not a blade of grass, nor a grain of earth; it was bare and iron-

like stone, crusted round all the coast, as far as high-water mark, with limpet and still smaller shells. We ascended wrinkled hills of black stone, and descended into worn and dismal cells of the same; into some of which, where the tide got entrance, it came pouring and roaring in raging whiteness, and churning the loose fragments of whinstone into round pebbles, and piling them up into deep crevices with seaweeds, like great round ropes and heaps of fucus. Over our heads screamed hundreds of hovering birds, the gull mingling its hideous laughter most wildly."

As the night was beginning to close in one rough September day in the year 1838, a steamer passed through the "Fairway," between the Fern Islands and the coast, on her passage northward. A stiff breeze was blowing right in her teeth; and, as she laboured in the heavy sea, a leak, which she had sprung soon after starting, but which the carpenter thought he had stopped up, began to gape again, and let in the water alarmingly. All hands were at the pumps, but still the water rose inch by inch, faster than they could pump it out. To make matters worse, a thick sleet was driving across the sea, the breeze was freshening to a gale; and the murky aspect of the sky, the hasty fleeting of the sea-birds shoreward, and many other signs, foretold a gathering storm. As the vessel pitched to and fro, the leak became worse and worse. The engine fires

were drowned out, and they had to hoist sails fore and aft, which had before been taken in for fear of the gale. The storm now burst upon them in all its fury; the wind blew a hurricane, the waves surged half-mast high, the sleet was driving thick and fast, and a dense fog enveloped them on every side. The tide set strongly for the south, and the disabled vessel, wheeling round, drifted helplessly along with it.

As the night advanced the fog lifted a little, and the crew saw a white line of breakers leeward of the vessel, with the Fern lights shining dimly through the haze. There was now no chance of escape, for on the one hand was the rocky shore, and on the other the iron-bound islands, and between them a strong current was running. The ill-fated vessel drifted on, and, although the captain put up his helm, the ship, refusing to obey it, was hurled, stem foremost, on to a sharp ridge of rocks.

The 'Forfarshire,' which was commanded by Mr. John Humble, had on board twenty-two cabin passengers, nineteen steerage passengers, and a crew of twenty-one; making, with the captain's wife, who was also on board, sixty-three persons. It was a vessel of about 300 tons, comparatively new, but with the boilers in bad condition; and, even before she sailed from Hull there had been some indisposition to go to sea in her. One of the survivors, Mrs. Dawson, stated that, owing to the commotion amongst the crew as to the condi-

tion of the boilers, she was most unwilling to go on board, and had her husband been present she would have returned on shore with him.

When the vessel struck upon a ledge of rocks, with a sheer depth of water under her estimated at over a hundred fathoms, despair might well seize on both passengers and crew. "The scene on board was of the most awful kind. Several females were uttering cries of anguish and despair, and amongst them stood the bewildered master, whose wife, clinging to him, besought the protection which it was not in his power to give. Very soon after the first shock, a powerful wave struck the vessel on the quarter, and, raising her off the rock, allowed her immediately after to fall violently down upon it, the sharp edge striking it about midships. She was by this fairly broken in two pieces; and the afterpart, containing the cabin, with many passengers, was instantly carried off through a tremendous current called the Pifa Gut, which is considered dangerous even in good weather, while the forepart remained on the rock. The captain and his wife seem to have been amongst those who perished in the hinder part of the vessel.

"At the moment when the boat parted about eight or nine of the passengers betook themselves to the windlass in the forepart of the vessel, which they conceived to be the safest place. Here also a few sailors took their station, although

despairing of relief. In the fore-cabin, exposed to the intrusion of the waves, was Sarah Dawson, the wife of a weaver, with two children. When relief came life was found trembling in the bosom of this poor woman, but her two children lay stiffened corpses in her arms.

"The sufferers, nine in number—five of the crew and four passengers—remained in their dreadful situation till daybreak, exposed to the buffeting of the waves amidst the darkness, and fearful that every rising surge would sweep the fragment of the wreck on which they stood into the deep. Such was their situation when, as day broke on the morning of the 7th, they were descried from the Longstone by the Darlings, at nearly a mile's distance. A mist hovered over the island; and though the wind had somewhat abated its violence, the sea, which even in the calmest weather is never at rest between these iron pinnacles, still raged fearfully. At the lighthouse there were only Mr. and Mrs. Darling and their heroic daughter.

"To have braved the perils of that terrible passage then would have done the highest honour to the well-tried nerves of even the stoutest of the male sex. But what shall be said of the errand of mercy being undertaken and accomplished mainly through the strength of a female heart and arm? Through the dim mist, with the aid of a glass, the figures of the sufferers were seen clinging to the wreck. But who could

dare to tempt the raging abyss that intervened, in the hope of succouring them? Mr. Darling, it is said, shrank from the attempt. Not so his daughter. At her solicitation the boat was launched, with the assistance of her mother, and father and daughter entered it, each taking an oar. It is worthy of being noticed, that Grace never had occasion to assist in the boat previous to the wreck of the 'Forfarshire,' others of the family being always at hand."

We may imagine the feeling of delight with which the sufferers beheld the little boat tossing toward them—now all but shattered on a rock, now seemingly swallowed up by some monster wave, but foot by foot approaching them, till they could distinguish the figures of their preservers; and the amazement with which they gazed upon the calm, earnest face of the heroic Grace, by the side of her gray, weather-beaten father. Several burst into tears; some looked at each other with a stupid stare, rubbed their eyes and pinched their arms, to convince themselves that they were not dreaming, and that they were really awake and—saved! All hearts were softened, and many a fervent prayer—with some, perhaps, the first for years—went up to heaven in gratitude for their marvellous rescue and for blessings on their preservers.

THE 'BIRKENHEAD.'

While the heroism of a woman

thus gilds the story of the earlier days of steam navigation, a striking instance of self-sacrifice and devotion to duty is recorded at a later period, when the steam troop-

ship 'Birkenhead' was lost upon a reef of rocks off the South African coast. The vessel had in all 652 people on board, consisting of the crew, detachments from seve-



ral regiments, and wives and children of many of the soldiers, under command of Colonel Seton of the 74th Highlanders. It was a clear night, in the month of February 1852, when the vessel struck

on a reef of rocks, and, from the violence of the waves, and the rapidity with which she was moving through the water, she speedily became a hopeless wreck. When the shock was first felt, the whole

of the men and officers rushed on deck, and Colonel Seton, gathering the other officers round him, strongly impressed on them the absolute necessity of preserving order and silence among the men, and placing them at the disposal of the captain of the vessel.

Work was speedily found for them; sixty were placed at the pumps, others were detached to disengage the boats, some threw the horses overboard so as to lighten the ship, while the remainder were ordered to take their station on the poop, to ease the fore part of the vessel. Each order was executed without a murmur; every one did as directed; not a complaint or cry was heard. The soldiers were as steady as if on parade, and as willing to occupy their several posts as though doing ordinary garrison duty.

The helpless women and children had speedily thronged on deck, and were now assisted into the cutter and two smaller boats, which were then pushed off. Unhappily, the largest boat was too much encumbered to be got at quickly enough, while the two next in size came to an unfortunate end; one capsized, the other was stove in by the fall of the funnel, which took place only twelve or fifteen minutes after the ship struck. As soon as the cutter and two smaller boats had cleared the vessel she broke in two parts, crosswise, and the stern part began to sink and fill with water. Seeing that the end was very near, the captain cried out, "All those that can

swim jump overboard and swim for the boats!" Colonel Seton and his officers, on the contrary, urged their men to remain, showing them how fatal would be the result to the women and children, that the boats must inevitably be swamped if the captain's mandate was obeyed. *And the men stood still.* Not more than three made the attempt. Officers and men alike waited, willing to face death rather than endanger the women and children; and the young soldiers were as patiently resolute as their elders. A few moments more and the whole of these brave men were washed into the sea; some immediately sank, some clung to spars, while others kept themselves afloat as long as possible by swimming. The boats picked up a few, and then made for the shore, which was only two miles off, hoping to land those rescued and return for more; but the surf ran so high that they were unable to effect a landing, and after beating about till daylight were at last picked up by a schooner, which then made for the wreck, where many were still clinging, but in a dreadful state of exhaustion.

Very few, either of men or horses, succeeded in swimming to the shore; more would have done so, but on their way were seized and devoured by the sharks that throng those waters. Out of the six hundred and fifty-two souls the 'Birkenhead' contained when she struck, only one hundred and ninety-two were saved. But those who were lost, sailors and soldiers

alike, have not been unmourned or forgotten. The memory of their deed is enshrined in the hearts of their fellow-countrymen, and a monument at Greenwich, erected by command of Queen Victoria, records the "heroic constancy and unbroken discipline." Sir Francis H. Doyle has preserved the story of these heroic men in the following lines:—

Right on our flank the crimson sun
went down,

The deep-sea rolled around in dark
repose,

When, like the wild shriek from some
captured town,
A cry of women rose.

The stout ship 'Birkenhead' lay
hard and fast,

Caught, without hope, upon a hid-
den rock ;

Her timbers thrilled as nerves, when
through them passed
The spirit of that shock.

And ever, like base cowards who
leave their ranks

In danger's hour before the rush
of steel,

Drifted away, disorderly, the planks
From underneath her keel.

Confusion spread, for, though the
coast seemed near,

Sharks hovered thick along that
white sea-brink.

The boats could hold—not all—and
it was clear

She was about to sink.

Out with those boats, and let us
haste away,"

Cried one, "ere yet yon sea the
barque devours."

The man thus clamouring was, I
scarce need say,

No officer of ours.

We knew our duty better than to care
For such loose babblers, and made
no reply ;

Till our good colonel gave the word,
and then

Formed us in line to die.

There rose no murmur from the
ranks, no thought,

By shameful strength, unhonoured
life to seek ;

Our post to quit we were not trained,
nor taught

To trample down the weak.

So we made women with their child-
ren go ;

The oars ply back again, and yet
again ;

While inch by inch the drowning
ship sank low,

Still under steadfast men.

What follows why recall ? The brave
who died,

Died without flinching in the
bloody surf ;

They sleep as well beneath that
purple tide

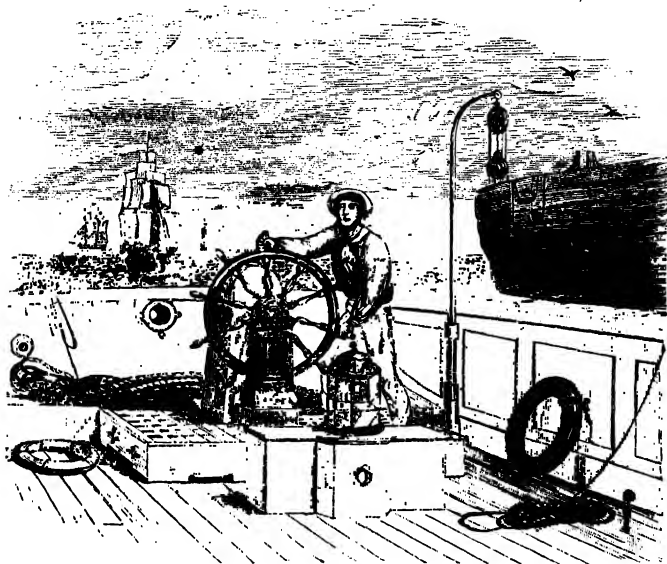
As others under turf.

AMERICAN RIVER STEAMERS.

The steamboats of the Missis-
sippi form a class by themselves,
and lengthy descriptions of them
are not required when the illustra-
tion at the beginning of the
chapter is looked at. The negro
idea that it is "like a meetin'
house afloat"—as expressed in a
song brought home by Mr.
Templeton, the famous Scottish
vocalist, after his American tour
—conveys perhaps as good a con-
ception of the boat as can be
obtained. The tiers of saloons,
raising the upper deck high above
the surrounding country at many
places of the river ; the multi-
form accommodations provided,
from a barber's shop to a billiard-
room ; the "snags" and "sawyers"

in the river—to guard against the effects of which the vessels are built with a water-tight compartment called the “snag-chamber,”—the reckless racing of the boats, which makes them so dangerous that, as Sir Charles Dilke tells, the fares are collected every five minutes in case of accident ;—all

these and many other stories have been told, till the character and description of an American river steamer must be familiar to all. In the records of heroism these boats are not without their place, the story of John Maynard, the steersman of such a boat on Lake Erie, having an honoured place in



American literature. The steamship ‘Jersey’ lay, one lovely May morning, off the town of Buffalo, “decked with flags,” and with the Blue Peter at her mainmast. Porters were hurrying along the narrow quay which juts out into the lake ; boatmen were quarrelling with each other ; travellers hurrying backwards and forwards looking for their luggage ; friends

shaking hands, and bidding each other farewell ; idlers lounging about with their hands in their pockets ; car-drivers jangling for a larger fare ; and all the various kinds of bustle and confusion that attend the departure of a packet from a watering-place.

“ But presently the anchor was heaved, the paddles began to turn, and, leaving a broad track of

foam behind her, the 'Jersey' stood westward, and held on her course for the town of Erie. Some mingled in busy conversation on politics ; some sat apart, and calculated the gains of the shop or the counting-house ; some were wrapped up in the book with which they were engaged ; and one or two, with whom time seemed to hang heavily, composed themselves to sleep. In short, one and all were like men who thought that, let danger come to them when it might, at least it would not be that day.

"It drew towards four in the afternoon, and the steamer, which had hitherto been keeping the middle of the lake, stood southwards—Erie, the place to which it was bound, lying on the southern side. Old John Maynard was at the wheel ; a bluff, weather-beaten sailor, tanned by many a burning summer day and by many a winter tempest.

"The land was about ten miles off, when the captain, coming on deck, saw smoke coming out from the hold. He rushed down, and found that some sparks had fallen on a bundle of tow ; no one had seen the accident, and now not only much of the luggage, but the sides of the vessel were in a smouldering flame.

"All hands, passengers as well as sailors, were called together ; and two lines being made, one on each side of the hold, buckets of water were passed and repassed ; they were filled from the lake, they flew along a line of ready

hands, were dashed hissing on the burning mass, and then passed on to the other side to be refilled. For some moments it seemed as if the flames were subdued.

"In the meantime, the women on board were clustering round John Maynard, the only man unemployed who was capable of answering their questions. 'How far is it to land?' 'How long shall we be getting in?' 'Is it very deep?' 'Is there no boat?' 'Can they see us from shore?' The helmsman answered as well as he could. There was no boat ; it had been left at Buffalo to be mended ; they might be seven miles from shore ; they would probably be in in forty minutes ; he could not tell how far the fire had reached. 'But, to speak truth,' he added, 'we are all in great danger ; and I think if there were a little less talking and a little more praying, it would be the better for us, and none the worse for the boat.'

"It happened that a draught of wind drove back the flames, which soon began to blaze up more furiously against the saloon ; and the partition betwixt it and the hold was soon on fire. Then long wreaths of smoke began to find their way through the skylight ; and the captain, seeing this, ordered all the women forward. The engineer put on his utmost steam. The American flag was run up, and reversed, in token of distress. Water was flung over the sails to make them hold the wind. And still John Maynard

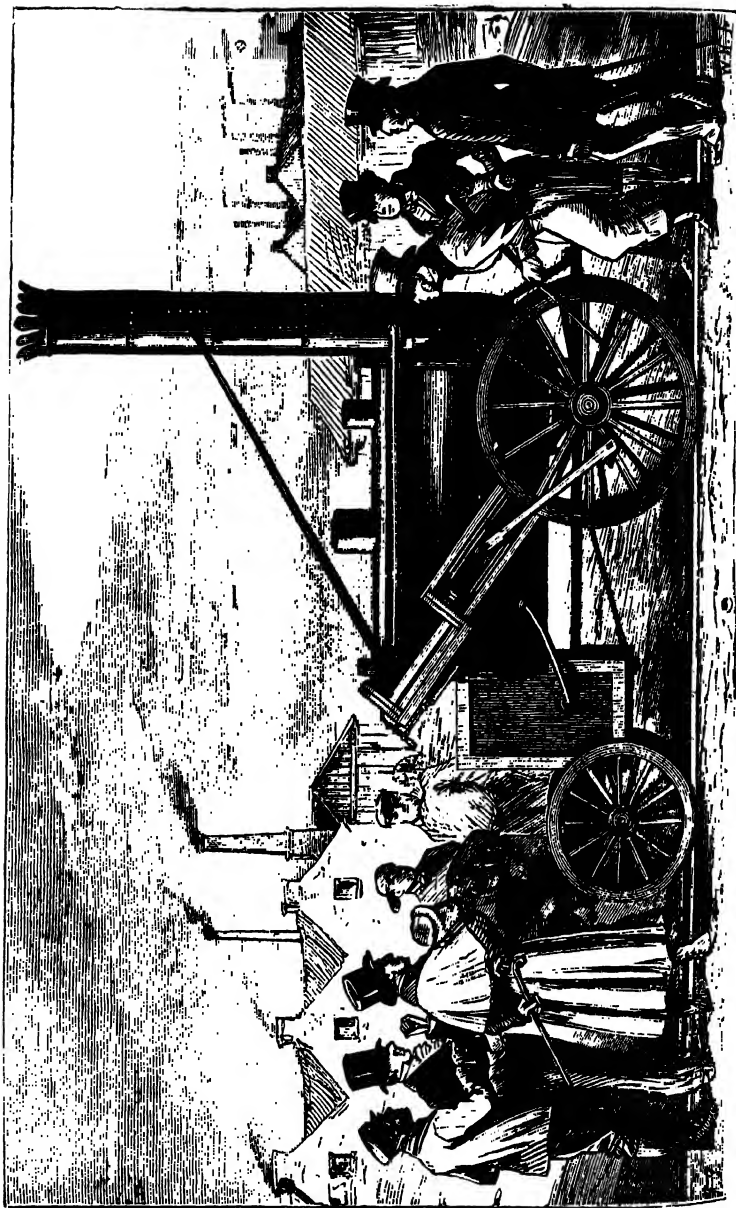
stood by the wheel, though now he was cut off by a sheet of smoke and flame from the ship's crew.

"Greater and greater grew the heat. The engineers fled from the engine-room ; the passengers were clustering round the vessel's bow ; the sailors were sawing planks to which to lash the women ; the boldest passengers were throwing off their coats and waistcoats, and preparing for one long struggle for life. And still the coast grew plainer and plainer ; the paddles as yet worked well ; they could not be more than a mile from the shore, and boats were even now starting to their assistance. 'John Maynard !' cried the captain. 'Ay, ay, sir !' said John. 'Can you hold on five minutes longer ?' 'I'll try, sir,' came back the answer. And he did try. The flames came nearer and nearer ; a cloud of smoke would sometimes almost suffocate him ; his hair was singed ; his blood seemed on fire with the great heat. Crouching as far back as he could, he held the wheel firmly with his left hand, till the flesh shrivelled and the muscles cracked in the flames ; and then he stretched forth his right, and bore the same agony without a scream or groan. It was enough for him that he heard the cheer of the sailors to the approaching boats, and the cry of the captain, 'The women first, and then every man for himself, and God for us all.' These were the last sounds that he heard. How he perished was not known ; whether, dizzied by the smoke, he

lost his footing in endeavouring to come forward, and fell overboard, or whether he was suffocated by the dense smoke, his comrades could not tell. At the moment the vessel struck, boats were at her side, passengers and crew leaped into them, and all, save the heroic helmsman, were rescued !"

As a reverse to this picture, the following Yankee story may be given, to show what happened when a steamboat got blown up :—

"I had landed at Helena for a minute to drop some letters into the post-office, when all of a sudden I heard a tremendous explosion, and, looking up, saw that the sky was for a minute darkened with arms, legs, and other small bits and scraps of my fellow-travellers. Amongst an uncommonly ugly medley, I spied the second clerk, about one hundred and fifty feet above my own level. I recognised him at once, for ten minutes before I had been sucking a sherry-cobbler with him out of the same rummer. Well, I watched him. He came down through the roof of a shoemaker's shop, and landed on the floor close by the shoemaker, who was at work. The clerk, being in a hurry, jumped up to go to the assistance of the other sufferers, when the 'man of wax' demanded five hundred dollars for the damage done to his roof. 'Too high,' replied the clerk ; 'never paid more than two hundred and fifty dollars in my life, and I've done the same thing often.'"





THE RAILWAY.

CHAPTER I.

No speed with this can fastest horse compare,
No weight like this canal or vessel bear.
As this will Commerce every day promote
To this let sons of commerce give their vote.

Thomas Gray.

WHEN WERE RAILWAYS FIRST MADE?—RAILWAYS TWO CENTURIES AGO
—VARIOUS FORMS OF RAIL—FIRST PROJECTORS OF PASSENGER
RAILWAYS—THE EARLIEST LOCOMOTIVE—RAPID TRAVELLING—
RAILWAY ACTS BEFORE 1825—THE STOCKTON AND DARLINGTON
—HOW THE ACT WAS OBTAINED—GEORGE STEPHENSON AND
EDWARD PEASE—OPENING OF THE RAILWAY—FIRST LOCOMOTIVE
RAILWAYS IN SCOTLAND—THE CANTERBURY AND WHITSTABLE
—THE LIVERPOOL AND MANCHESTER LINE—THE LOCOMOTIVE
COMPETITION—OPENING OF THE LINE—THE FIRST RAILWAY
ACCIDENT.

WHEN WERE RAILWAYS FIRST MADE?

THERE were first-class carriages before Pullman cars, standing carriages before the law compelled the railways of Britain to carry travellers at a penny a mile under cover, horse-tracks before locomotives, goods and coal lines before passenger trains, iron tramroads before railways, and wooden tramroads before iron ones. The historian of railways knows exactly how far he can bring forward his story, but must always remain in a difficulty as to the date that should form his starting-point. Some writers go very far back indeed, finding in the railway

system a fulfilment of prophecy. "And I looked, and behold a whirlwind came out of the north, a great cloud and a fire," says Ezekiel, and his description of the vision of the chariot has been characterised as so appropriate in its language, so true and so intelligible, that its meaning cannot possibly be mistaken. The person who thus found, in the method of travelling invented in the nineteenth century, a realisation of prophecy, had not paused, it may be remarked, to "ask where's the north?" otherwise he would scarcely have concluded that the circum-

stances of an Act having been obtained for a coal-waggon way at Leeds in 1758, of the Stockton and Darlington being the first passenger line, and of Stephenson's 'Rocket' being first shown at Manchester, fulfilled the visions of the prophet Ezekiel.

RAILWAYS TWO CENTURIES AGO.

Whether railways are described by anticipation or not in the pages of sacred writ, we are able to claim for them a more respectable antiquity than is perhaps generally imagined. Just two centuries ago, in the *Life of Lord Keeper Guildford*, we read the following :—

"When men have pieces of ground between the colliery and the river, they sell *leave* to lead coals over their ground, and so dear, that the owner of a rood of ground will expect £20 per annum for this leave. The manner of the carriage is by laying rails of timber from the colliery down to the river, exactly straight and parallel ; and bulky carts are made with four rowlets fitting these rails, whereby the carriage is so easy that one horse will draw down four or five chaldrons of coals, and is an immense benefit to the coal-merchants."

There is mention made of tramways as early as 1602 ; but there is some convenience in accepting the period of two centuries as the starting-point in noticing the history of railways. The tramways described in the above extract were of wood, and it was not till

the opening of the eighteenth century that the wood came to be protected with iron. In the early part of that century many tramways appear to have been laid down to connect collieries with the ports whence the coal was shipped. One of these has obtained some historical interest ; namely, the railway between Tranent colliery and its port of Cockenzie, in East Lothian—a railway still in existence—part of the embankment of which was used as a position for his cannon by "Johnny Cope" in the battle of Prestonpans, in 1745. In the *Travels of St. Fond* it is mentioned that coals could be imported from England at Marseilles cheaper than French coals of inferior quality, and the facilities for conveying coals to the ports in this country, by the use of the tramways, and the method of shipping direct from the waggons, is believed to have had some share in bringing about this result.

One of the earliest records of the use of iron to protect the wooden trams is in connection with the ironworks at Colebrookdale, in Shropshire, subsequently celebrated for the erection of the first considerable iron bridge, and where, about 1760, iron plates were nailed to the wooden rails, as well to diminish friction as to prevent abrasion. This soon led to the substitution of rails of solid iron, which was attended with rapid success, and adopted in various parts of the country. There was, for instance, a railway five miles long, from the collieries

in the vicinity of Derby into that town; there was another called the Park Forest Railway, about six miles long; and another, near Ashby-de-la-Zouch, in Leicestershire, which had four miles of double and eight miles of single rails. Towards the beginning of the present century, railways had made their way into all coal and mining districts, and their progress was so rapid that in 1811 there were in South Wales not less than 150 miles of railways, of which the Merthyr Tydvil Company possessed thirty miles.

Amongst personal reminiscences of these primitive railways by persons living to our own day, it may be interesting to quote those of Mr. Robert Reid, who was born in 1772. In his interesting memoirs of "Old Glasgow," he says:—

"I remember the Coal Quay, which stood at the present ferry, west end of Windmill Croft. It was built by the Dumbarton Glass Work Company to convey coals from the lands of Little Govan to their works at Dumbarton. The river was then deeper at the Coal Quay than at the Broomielaw. There was a timber tramway from the Little Govan works to the said quay, which ran through the lands of Kingston, and by the road on the east side of Springfield. *I have walked upon this tramroad, which I believe was the first of our Glasgow railways.* The Dumbarton Glass Work Company also possessed a tramroad on the north side of the Clyde, from the coal works in the neighbourhood of Gartnavel."

But while in regard to the transit and shipment of coals this considerable advance was made, the other branches of traffic, depending on the wretched country roads of last century, remained for half-a-century longer in the depths of barbarity.

"I observed to-day," says Boswell, in his *Tour to the Hebrides*, "that the common way of carrying home their grain here is in loads, on horseback. They have also a few sleds or *cars*, as we call them in Ayrshire, clumsily made and rarely used." An aged East Lothian farmer, recently dead, informed the writer that in his youth the mode of bringing grain to the market at Haddington was on pack horses. This was within recent memory, before there were either made roads or railways!

VARIOUS FORMS OF RAIL.

The solid iron rails mentioned as having been introduced at Colebrookdale were called "scantlings," and consisted of 5-feet long pieces, 4 inches in breadth, which were laid down under the wheel, simply to decrease friction, as the wooden trams had previously been. The next stage, that of casting rails with an upright flange to keep the wheels on the track, was reached about 1776, in connection with a colliery belonging to the Duke of Norfolk, near Sheffield. Though the flange was subsequently taken from the rail and put on the wheel, the first century of railway history closes

with the adoption of the two chief features of the railway as a travelling track—the use of cross sleepers on which to fasten the rails, and the introduction of the flange to keep the cars upon the track.

A quarter of a century brought the invention of the oval rail, with a grooved tire upon the wheels, another step towards the realisation of subsequent success. This “edge railway” as it was called, was first used at Lord Penrhyn’s slate quarries in Wales. It being found that the oval rail wore into the wheel and caused it to stick, the next step was to make the surface of the rail and the edge of the wheel flat, and, *voilà tout*, the railway as we know it was made. There have been many improvements in the mode of manufacture, in the kinds of sleepers used (stone or wood), in the method of fastening them, in the introduction of steel rails; in the discovery, very recently, that iron rails can be made even more durable and less expensive than steel. But the fundamental condition of the rail remains unchanged, and on the plan thus introduced early in the century all our great progress of to-day has been made.

FIRST PROJECTORS OF PASSENGER RAILWAYS.

Mr. R. L. Edgeworth, writing in *Nicholson’s Journal of the Arts*, in 1802, describes a project formed by him many years before for laying iron railways for baggage

waggons on the great roads of England. Objections as to first cost and maintenance had deterred him from promoting it, and to obviate the latter he proposed to use a series of smaller cars—the modern “train”—in order to save the wear of the rails. In 1768 he obtained the Society of Arts’ gold medal, for models of his carriages, and twenty years later he made four carriages which were used for some time on a wooden line of rails to convey lime for farming purposes. Besides using his proposed railways for heavy waggons at a slow pace, Mr. Edgeworth thought means might be found of enabling stage-coaches to go *six* miles an hour, and post-chaises and gentlemen’s travelling carriages at *eight* miles an hour, both with one horse. Another proposal he made was that small (stationary) engines placed from distance to distance might by means of circulating chains be made to draw the carriages along roads with a great diminution of horse-labour and expense.

An attempt to take a systematic commercial view of the utility of railways was made in 1800, by Dr. James Anderson, in the fourth volume of his *Recreations in Agriculture*. He proposed to construct railways by the side of the turnpike roads, so as to follow the ordinary levels and lines of traffic: to commence with the highway from London to Bath. Where the road ascended a hill, the level was to be sought by going round its base, constructing a viaduct, or

piercing a tunnel; and so carefully were these contingencies discussed, that, with the exception of horses being the moving power, his plans and arguments might be accepted as the description of a railway of the present day. One point particularly insisted on was, that the railways should be managed by Government, not by private companies, who would unite monopoly with speculation; but should "be kept open and patent to all alike who shall choose to employ them, as the king's highway, under such regulations as it shall be found necessary to subject them by law." No immediate result followed the publication of Dr. Anderson's views; no one had then thought of railways independent of other thoroughfares, and to border the latter by iron routes was not to be entertained.

There is another name connected with the rise of railways which cannot be left unnoticed—Thomas Gray of Leeds. Hearing, while on the Continent in 1816, that a canal had been projected to connect the coal-fields of Belgium with the frontier of Holland, he recommended the making of a railway instead. His mind had been for some time directed to the subject; and in 1818 he showed to his friends a manuscript containing observations on a railroad for the whole of Europe. Soon after he returned to England for the purpose of making his scheme public; and in 1820 he published a volume entitled "*Observations on a General Iron Rail-*

way, or Land Steam Conveyance, to supersede the Necessity of Horses in all Public Vehicles: shewing its vast Superiority in every respect over the present pitiful methods of Conveyance by Turnpike-Roads and Canals." In this work, among advantages to result from the new system, Gray showed that fish, vegetables, agricultural and other perishable produce might be rapidly carried from place to place; that two post deliveries in the day would be feasible; and that insurance companies would be able to promote their own interests by keeping railway fire-engines, ready to be transported to the scene of a conflagration at a moment's warning! The cost of construction was calculated at £12,000 a mile; and his plan included a trunk-line from London to Plymouth and Falmouth; lines to Portsmouth, Bristol, Dover, and Harwich; an offset from the latter to Norwich, a trunk-line from London to Birmingham and Holyhead, another to Edinburgh by Nottingham and Leeds, with secondary lines from Liverpool to Scarborough and from Birmingham to Norwich. His system was not only remarkable for its simplicity, but comprehended all the important towns of the kingdom, and was in many respects preferable to the lines subsequently made. His plan for Ireland had a grand trunk-line from Dublin to Derry, another to Kinsale, and by lesser lines ramifying from these he sought to connect all the chief towns with the

Irish capital. Regarding his projects, Sir John Hawkshaw, in his British Association speech (1875), already quoted in this volume, remarked :—"No sooner had our ancestors settled down with what comfort was possible in their coaches, well satisfied that twelve miles an hour was the maximum speed to be obtained or that was desirable, than they were told that steam conveyance on iron railways would supersede their 'present pitiful' methods of conveyance. Such was the opinion of Thomas Gray, the first promoter of railways, who published his work on a general iron railway in 1819. Gray was looked on as little better than a madman. 'When Gray first proposed his great scheme to the public,' said Chevalier Wilson, in a letter to Sir Robert Peel in 1845, 'people were disposed to treat it as an effusion of insanity.' The struggles which preceded the opening of the first railway were brought to a successful issue by the determination of a few able and far-seeing men; and the names of Thomas Gray and Joseph Sanders, of William James and Edward Pease, should always be remembered in connection with the early history of railways, for it was they who first made the nation familiar with the idea."

Whatever effect Gray's persevering labours may have had in directing attention to the subject of railways, he himself gained neither reward nor honour. His late years were passed in obscurity as a dealer in glass on commission

at Exeter, in which city he died in October 1848, at the age of sixty-one. He died, it is said, "steeped to the lips in poverty."

In an early number of *Blackwood's Magazine* we have a notice of a railway in Munich nearly contemporary with the proposals of Gray :—"We have received a report from Munich, which, if it be not exaggerated, well deserves the attention of our countrymen. A model, on a large scale, of an iron railroad, invented and completed by the chief counsellor of the mines, Joseph von Baader, has been received at the Royal Repository for Mechanical Inventions, which is said to surpass in utility whatever has been seen in England; some say by a proportion of two-thirds, although it costs less by half. On a space perfectly level, laid with this invention, a woman or a child may draw with ease a cart laden with fifteen or sixteen hundredweight. And if no greater inclination than six inches and a half on a hundred feet in length be allowed, the carts will move of themselves, without any external impulse. A single horse may be the means of conveying a greater weight than twenty-two horses of the same strength on the best of common roads."

THE EARLIEST LOCOMOTIVE.

While there was thus a gathering together of testimony as regards the improvement of the roads over which wheeled vehicles

were to be drawn, there was gradually being developed the idea of employing another and more powerful agent for the propulsion of the vehicles. There cannot be the least doubt that the numerous attempts to apply steam to navigation acted on the minds of men of skill and invention in order to have the same powerful agent applied to the ordinary requirements of the road. Indeed, the first invention of William Symington was applied to a carriage as well as to a barge, and his diagram and detail of a steam-carriage were contemporary with his invention of a steamship. It was probably in the knowledge that such ideas were being wrought out into practical shape, that the lines were written by Dr. Darwin, to which the reputation of prophecy has almost attached :—

Soon shall thy arm, unconquer'd
Steam ! afar
Drag the slow barge, or drive the rapid
car ;
Or on the wide-waving wings expanded
bear
The flying chariot thro' the fields of
air !

So wrote Dr. Darwin in his *Botanic Garden*, in 1793, and the vision of the 'flying chariot' does not appear to-day much more extravagant than did, when these lines were published, the prediction of 'rapid' travelling by means of a steam-engine. Yet, nearly a century before, a very fair attempt at the construction of a locomotive steam-engine had been made. The scene of the experiment was Japan, and the actors in it were the

Jesuit missionaries, who sought to find favour with the Emperor Kanghi. They caused a waggon of light wood to be made, in the middle of which they placed a brazen vessel full of live coals, and on them an "eolipile," the wind from which issued through a little pipe upon a sort of wheel made like the sail of a windmill. This little wheel turned another with an axle-tree, and by that means the waggon was set a-running for two hours together. This description is rather that of a hot-air engine than a steam-engine, but it was a locomotive, and is the earliest of its race.

In the *Conservatoire des Arts et Métiers* in Paris is preserved the steam-carriage constructed by M. Cugnot in 1763, which was a remarkable machine, like a long brewer's cart with a boiler and engine at one end. It went with such force that it knocked down a wall, and its power was in consequence considered too great for ordinary use, and it was put aside as a dangerous invention.

A model of a steam-carriage was made in 1784 by William Murdoch, the friend and assistant of Watt, but it was of very diminutive proportions.

The suggestion for such an application of steam had been made by Dr. Robison of Edinburgh in 1759, to James Watt, who included the idea in his fourth patent, but seems to have doubted the safety of the carriage. He mentioned the idea to Murdoch, who proved practically, on a small scale, the

correctness of the calculations that had been made. Of Murdoch's machine it is narrated that on a dark night in the year named, the venerable clergyman of Redruth in Cornwall, when walking in a lonely lane leading to his church, heard a most unearthly noise, and beheld approaching him, at great speed, an indescribable creature, glowing with internal fires, and whose gasps for breath seemed to denote some internal struggle of a deadly kind. His cries brought the inventor, William Murdoch, to his side, who explained to him that this terrible monster was nothing more or less than a locomotive he had invented, and which had broken away from his control.

An equal amount of terror was created in some minds by the steam-carriage of Richard Trevithick, an eccentric engineer connected with the Cornish tin-mines, who had seen Murdoch's small carriage. In 1802 he took out a patent for this novel machine, which was exhibited to large crowds of spectators on what is now the site of Euston station. Coleridge relates that, when it was being conveyed from the place in Cornwall where it was constructed, to the port at which it was shipped to London, after carrying away a portion of the rails of a gentleman's garden, it came in sight of a closed toll-gate. Trevithick immediately shut off the steam, but the momentum was so great that the carriage proceeded some distance, coming dead up, however,

just on the right side of the gate, which was opened like lightning by the gatekeeper. "What have us got to pay here?" asked Trevithick's cousin, Andrew Vivian, who accompanied him. The poor toll-man, trembling in every limb, his teeth chattering in his head, essayed a reply,—"Na na, na na." "What have us got to pay, I say?" "No—, noth—, nothing to pay! My dear Mr. Devil, do drive on as fast as you can! Nothing to pay!"

Trevithick constructed another steam-carriage for railway purposes, which, in 1804, ran on the Merthyr Tydvil tramway in South Wales. It drew a load of ten tons at the rate of five miles an hour.

The earliest locomotives were designed to run upon a perfectly smooth line and a straight road; and for many years it was supposed that they could not climb hills or be made to go round corners, unless the wheels were provided with a cogged rim to work on a corresponding rack along the rails. The cogged or toothed wheels and rails were introduced, in 1811, by Mr. Blenkinsop of Leeds. It was not till 1813 that Mr. Blackett of Wylam, a coal proprietor, established the fact that locomotives, running with smooth wheels on smooth rails, could draw heavy loads up a moderate incline. His engine, called the 'Puffing Billy,' was otherwise clumsily constructed. It had only a single cylinder, and was full of pumps, plugs, and other gear,

which were always getting out of order.

In 1813, George Stephenson, by whom the locomotive engine was so vastly improved, and whose name has been immortalised by his subsequent discovery of combining it with a railway for travelling purposes, made a locomotive engine, which was called the 'Blucher.' This engine, on 25th July 1814, drew a load of 30 tons at the rate of four miles an hour. His second engine, patented in 1815, doubled, by the introduction of the steam-blast, the power of the engine, and practically solved the problem of power and speed, leaving it only to be developed by later improvements.

RAPID TRAVELLING.

The usefulness of steam for dragging heavy weights at a low velocity having been demonstrated by the engines of George Stephenson, the application of the same power to the more rapid conveyance of passengers was soon called for. The improved roads and Palmer mail-coaches had been branded as "pitiful" by Thomas Gray, and the era for superior methods of conveyance was rapidly approaching.

As a fitting prelude to a notice of the rise of this new system of locomotion, we may give the following contrast between the most "rapid act of horsemanship" on record and the triumphs of the railway, from the genial pen of Sir E. Head :—

"A good many years ago (in 1831) one of the toughest and hardest riders that ever crossed Leicestershire undertook to perform a feat, which, just for the moment, attracted the general attention, not only of the country, but of the sporting world. His bet was, that if he might choose his own turf, and if he might select as many thorough-bred horses as he liked, he would undertake to ride 200 miles in ten hours !!!

"The newspapers of the day described exactly how 'the Squire' was dressed—what he had been living on—how he looked—how at the word '*Away!*' he started like an arrow from a bow—how gallantly Tranby, his favourite racer, stretched himself in his gallop—how, on arriving at his second horse, he vaulted from one saddle to another—how he flew over the surface of the earth, if possible, faster than before—and how, to the astonishment and amidst the acclamations of thousands of spectators, he at last came in . . . a winner !

"Now, if at this moment of his victory, white with dust, and perspiration on his brow, his exhausted arms dangling just above the panting flanks of his horse, which his friends at each side of the bridle were slowly leading in triumph, a decrepit old woman had hobbled forward, and in the name of Science had told the assembled multitude that, before she became a skeleton, she and her husband would undertake, instead

of 200 miles in ten hours, to go 500—that is to say, that for every mile the ‘Squire’ had just ridden she and her old man would go two miles and a half; that she would knit all the way, and that he should take his medicine every hour and read to her just as if they were at home; lastly, that they would undertake to perform their feat either in darkness or daylight, in sunshine or in storm, ‘in thunder, lightning, or in rain;’—who, we ask, would have listened to the poor maniac?—and yet how wonderfully would her prediction have been fulfilled! Nay, waggons of coal and heavy luggage now-a-days fly across Leicestershire faster and farther than Mr. Osbaldistone could go, notwithstanding his condition and that of his horses.”

How the marvel thus described by the author of *Stokers and Pokers* was to be accomplished, how the means of attaining a mode of travelling that should excel anything that had yet been seen outside the realms of fancy, it is now our province to trace—to show how was realised, in a way the poet Coleridge perhaps little dreamed of, the picture of those who should,

Rushing on the storm with whirlwind
speed,
Yoke the red lightnings to their volley-
ing car.

“All the old miracles of locomotion—the arrow of Abaris, the car of Phaeton, the flying serpents of Triptolemus, the gryphons of the Arab magicians, and the wishing cap of Fortunatus—will be tardy and trifling to the steam-horse. Pegasus

himself never soared higher flights, nor the Python was more irresistible.” So wrote an early student of the new method of conveyance, and before we proceed to show how such great results were worked out, a few words may be desirable as regards the steps which led up to the opening of the Stockton and Darlington Railway, the parent passenger railway line of the world, and which, though only fifty years of age, has a progeny such as even the sanguine projectors of that line could never have foreseen. Yet even this remark must be qualified by the remembrance of what the elder Stephenson prophesied, when, as told by Mr. Smiles, in his *Life of Stephenson*, he and his son inspected the railway we have just named. It is narrated that, shortly before Robert Stephenson went to South America, he with his father and John Dixon inspected the works of the Stockton and Darlington line. While at dinner, the elder Stephenson said, “Now, my lads, I will tell you that I think you will live to see the day, though I may not live so long, when railways will come to supersede almost all other methods of conveyance in this country, when mail coaches will go by the railway, and railroads will become the great highway for the king and all his subjects. The time is coming when it will be cheaper for a working man to travel on the railway than to walk on foot.” It is hardly necessary to remark how fully this prediction has been realised.

RAILWAY ACTS BEFORE 1825.

The first Act of Parliament for the construction of a railway was passed in 1801, and was promoted by the Surrey Iron Company, for a railway nine miles long, from Wandsworth to Croydon, with a branch to Carshalton. The capital was £60,000, being about what is now considered the normal cost for a "light" railway or local single line locally promoted, namely £5500 per mile. This, the first line opened under parliamentary sanction, was completed in 1805; and, in connection with its opening, some very interesting experiments in traction were made. Taking the estimate of the draught of a horse, upon a good road, at fifteen hundred pounds, the party of gentlemen who assembled to witness the testing of the line were enabled to judge practically the advantages offered. Twelve waggons were filled with stones till each waggon weighed three tons, and a horse attached to them drew the load, with apparent ease, a distance of six miles in an hour and three quarters. In the course of the journey the horse was repeatedly stopped to show that he had the power of starting the load with apparent ease. At each stoppage other waggons were attached, and the men employed on the line, to the number of about fifty, were also directed to mount the waggons. At the end of the journey the entire load was found to have reached rather more than fifty-five tons!

In all about twenty Acts were

passed prior to that of the Stockton and Darlington line, mostly for short lengths, the longest being a line of thirty miles, from Sutton Pool, near Plymouth, to the neighbourhood of Dartmouth prison, the capital of which is stated at the extremely low total of £35,000.

The first line authorised in Scotland was from Kilmarnock to Troon, in Ayrshire, for which an Act was obtained in 1808, and which, for a length of about ten miles, was estimated to cost £65,000. This line was opened in 1810, and forming as it does an integral part of the large system now embraced under the name of the Glasgow and South-Western Railway, it entitles that Company to be considered the premier railway in Scotland.

It was about this time that Thomas Telford projected a very extensive scheme to connect the east and west of Scotland by a grand line, starting from Berwick, and proceeding by the valley of the Tweed to Kelso, Peebles, and Lanark, to the town of Ayr! "We admire," says the compiler of the *Scottish Railway Shareholders' Manual*, in 1849, "the genius and sagacity evinced by so magnificent a design; but we do not wonder that, in face of prejudice and ignorance on the part of the public, in the infancy of railway undertakings, it should have been laid aside and forgotten." In 1811 the Berwick and Kelso Company projected a line occupying part of Telford's ground, but this parti-

cular railway was never carried out. The scheme lay dormant for many years—for, unlike more modern Acts, no limitation of time was put in the Act, so that the powers did not lapse—and no step was ever made to carry it out. It is true that later works have occupied nearly all the ground projected by Telford, so that a railway journey by Kelso, Peebles, and Lanark to Ayr can at this day be made per rail, over substantially the same ground as was taken up by the great engineer. But the main lines of connection for traffic purposes, between the east and west of Scotland, have been found elsewhere.

The greater number of the companies incorporated by the Acts up to this time embraced but few persons, and consisted mostly of merchants or owners of collieries seeking an outlet for their goods. Thus, the capital of the Penrhyn-maur line, for which an Act was obtained in 1812, was held by two men, the Earl of Uxbridge and Mr. Holland Griffith. On none of the lines for which Acts were obtained up to 1820 was any other motive power used or designed than that of horses, and not one of the companies even proposed the adoption of the steam-engine, though the invention was by this time beginning to attract attention, nor did the idea of conveying passengers seem to be entertained.

THE STOCKTON AND DARLINGTON.

This was, however, to be com-

pletely changed by the Act obtained in 1821, in which the clause defining the method of haulage spoke of "the making and maintaining of the tramroads and the passage upon them of waggons and other carriages, with men, and horses, or otherwise,"—words sufficiently elastic to admit of any power being used. However, taking the Act altogether, it can hardly be considered that Mr. Edward Pease, who was the chief promoter of the line, had it in view to use anything else than horse-power, or that he was much moved by 'Sir Richard Phillips' recommendation that they should use "Blenkinsop's steam-engine."

HOW THE ACT WAS OBTAINED.

The Stockton and Darlington scheme had to run the gauntlet of a fierce opposition in three successive sessions of Parliament. The application of 1818 was defeated by the Duke of Cleveland, who afterwards profited so largely by the construction of the railway. The ground of his opposition was that the line would interfere with one of his fox covers, and through his influence the bill was thrown out.

Several energetic men, however, were now at the head of the scheme, and they determined to persevere with it. Amongst these, Edward Pease might be regarded as the backbone of the concern. Opposition did not daunt him, nor failure defeat him. When apparently overthrown, he rose again,

like Antæus stronger than before, and made another and stronger effort. He had in him the energy and patient perseverance of many men.

The next year, 1819, an amended survey of the line was made; and, the Duke of Cleveland's fox cover being avoided, his opposition was thus averted. But as Parliament was dissolved on the death of George III., the bill was necessarily suspended until another session.

The principal opposition now came from the road trustees, who spread it abroad that the mortgagees of the tolls arising from the turnpike road leading from Darlington to West Auckland would be seriously injured by the formation of the proposed railway. On this, Mr. Edward Pease issued a printed notice requesting any alarmed mortgagees to apply to the company's solicitors at Darlington, who were authorised to purchase their securities at the price originally given for them. This notice had the effect of allaying the alarm, and the bill, though still strongly opposed, was allowed to pass both Houses of Parliament in 1821.

The preamble of the Act sets forth the public utility of the proposed line for the conveyance of coal and other commodities from the interior of the county of Durham to Stockton and the northern parts of Yorkshire. Nothing was said about passengers, for passenger traffic was even then not contemplated; and nothing

was said about locomotives, as it was at first intended to work the line entirely by horse-power. The road was to be free to all who chose to place their waggons and horses upon it for the haulage of coal and other merchandise, provided they paid the tolls fixed by the Act.

The company were empowered to charge fourpence a ton per mile for all coal intended for land sale; but only a halfpenny a ton per mile for coal intended for shipment at Stockton. The latter low rate was introduced in the Act through the influence of Mr. Lambton, afterwards Earl of Durham, for the express purpose of preventing the line being used in competition against him; for it was not believed possible that coal could be carried at that rate except at a heavy loss. As it was, the low rate thus fixed proved the vital element in the future success of the Stockton and Darlington Railway.

The capital specified by the Act was of small amount, and, as events proved, it was altogether inadequate. The share capital was fixed at £82,000, in shares of £100 each, and, in the event of this not being found sufficient, power was given to raise £20,000 more by shares. If the shares were not taken by the public, then the necessary capital, within the above limits, might be raised by the issue of mortgages or promissory notes. These powers were necessarily greatly enlarged by subsequent Acts to enable the line

to be completed and placed in sound working order.

While the Stockton and Darlington Railway scheme was still before Parliament Mr. Edward Pease was writing articles for a York newspaper, urging the propriety of extending it southward into Yorkshire by a branch from Croft. It is curious now to look back upon the arguments by which Mr. Pease sought to influence public opinion in favour of railways, and to observe the very modest anticipations which even its most zealous advocate entertained as to their supposed utility and capabilities.

"The late improvements in the construction of railways," Mr. Pease wrote, "have rendered them much more perfect than when constructed after the old plan. To such a degree of utility have they now been brought, that they may be regarded as *very little inferior to canals*."

"Though the railways at Carron [in Scotland] are not exempt from slight risings and depressions, the reduction which they have occasioned in a distance of six miles merits much attention. Before their establishment the Carron Company paid £1200 monthly on an average for carriage, but since then the number of horses employed has been diminished by three-fourths, and the expenditure on carriage reduced to about £300 a month, effecting a saving to the company of equal to £10,000 a year. Coal, lime, stone, and grain can also be conveniently weighed

by machines placed under the railway depots and at different points of loading and discharging. The weighing on departing and arriving would also be a great check to fraud.

"One horse can draw, by means of a railway, on a level or slightly-inclined plane, from eight to sixteen waggons of one ton each, and each waggon may be loaded with different kinds of goods to suit the traffic on the line.

"If we compare the railway with the best lines of common road, it may be fairly stated that in the case of a level railway the work will be increased in at least an eightfold degree. The best horse is sufficiently loaded with three-quarters of a ton on a common road, from the undulating line of its draught, while on a railway it is calculated that a horse will easily draw a load of ten tons. At Lord Elgin's works, Mr. Stevenson, the celebrated engineer, states that he has actually seen a horse draw twenty-three tons thirteen cwt. upon a railway, which was in some parts level, and at others presented a gentle declivity!

"The formation of a railway, if it creates no improvement in a country, certainly bars none, as all the former modes of communication remain unimpaired; and the public obtain, at the risk of the subscribers, another and better mode of carriage, which it will always be to the interest of the proprietors to make cheap and serviceable to the community.

"On undertakings of this kind, when compared with canals, the advantages of which (where an extensive traffic on the ascending or descending line can be obtained) are nearly equal, it may be remarked that public opinion is not easily changed on any subject. It requires the experience of many years, sometimes ages, to accomplish this, even in cases which by some may be deemed obvious. Such is the effect of habit, and such the aversion of mankind to anything like innovation or change. Although this is often regretted, yet, if the principle be investigated in all its ramifications, it will perhaps be found to be one of the most fortunate dispositions of the human mind.

"The discovery of the cast-iron railway is comparatively of recent date. It is not only intimately connected with inland navigation, and originated with it, but will be found, as it becomes more perfect, to add to the efficiency and utility of that system of communication, whilst every step in advance must materially promote the interests of the agriculturist, the miner, the merchant, the mariner, and, in short, of the community at large.

"The system of cast-iron railways is as yet to be considered but in its infancy. It will be found to be an immense improvement on the common road and also on the wooden railway. It neither presents the friction of the tramway nor partakes of the perishable nature of the wooden

railway, and, as regards utility, it may be considered as the medium between the navigable canal and the common road. We may, therefore, hope that as this system develops itself our roads will be laid out as much as possible on *one level*, and in connection with the great lines of communication throughout the country."

Such were the modest anticipations of Edward Pease, respecting railways, about the year 1818. Ten years after, and an age of progress, by comparison, had been made. Mr. Pease did not at first so much as dream of the locomotive, his anticipations being solely based on the employment of horse-power.

GEORGE STEPHENSON AND EDWARD PEASE.

If no other, the Act of April 19, 1821, had one important and immediate consequence in bringing "the engine-wright of Killingworth" [as George Stephenson modestly styled himself] into contact with Edward Pease. He called at his house, as he told the worthy Quaker, because he had heard of the Act, bringing with him a letter of introduction from the director of the Killingworth pits. The conversation that followed, after George Stephenson had presented his letter to Edward Pease, was highly characteristic of both men. As recorded by Mr. Smiles, the originator of the Stockton-Darlington line "very soon saw that his visitor was the man for his pur-

pose. The whole plans of the railway being still in an undetermined state, Mr. Pease was glad to have the opportunity of gathering from Mr. Stephenson the results of his experience. The latter strongly recommended a railway in preference to a tramroad, in which Mr. Pease was disposed to concur with him. The conversation next turned to the tractive power which the company intended to employ, and Mr. Pease said that they had based their whole calculations on the employment of horse-power. 'I was so satisfied,' said he afterwards, 'that a horse upon an iron road would draw ten tons, for one ton on a common road, that I felt sure that before long the railway would become the king's highway.'

"Mr. Pease was scarcely prepared for the bold assertion made by his visitor, that the locomotive engine with which he had been working the Killingworth Railway for many years past was worth fifty horses, and that engines made after a similar plan would yet entirely supersede all horse-power upon railroads. Mr. Stephenson was daily becoming more positive as to the superiority of his locomotive; and on this, as on all subsequent occasions, he strongly urged Mr. Pease to adopt it. 'Come over to Killingworth,' said he, 'and see what my 'Blucher' can do. Seeing is believing, sir.' And Mr. Pease promised that on some early day he would go over to Killingworth with his friend John Richardson, and take a look

at this wonderful machine that was to supersede horses. On Mr. Pease referring to the difficulties and the opposition which the projectors of the railway had had to encounter, and the obstacles which still lay in their way, Stephenson said to him, 'I think, sir, I have some knowledge of cranialogy, and from what I see of your head I feel sure, that if you will fairly buckle to this railway you are the man successfully to carry it through.' 'I think so too,' rejoined Mr. Pease, 'and I may observe to thee, that if thou succeed in making this a good railway, thou may consider thy fortune as good as made.' The remark and reply were alike characteristic of the promoters of the first railway.

The graphic description, by an early friend, of Mr. Edward Pease, that "he was a man who could see a hundred years ahead," was strikingly proved in the weeks that followed his first interview with George Stephenson. Having accepted the invitation to "come over to Killingworth," and having seen with his own eyes what "my 'Blucher' can do," his mind became at once clear as to the immense future awaiting the introduction of the "iron horse" upon the iron railway, and he not only strongly advocated the use of locomotives, but made himself Stephenson's partner in their manufacture. Through his influence the still unknown engine-wright at Killingworth was appointed engineer of the Stockton-Darlington line, and at his urgent request Mr. Pease

applied for a new Act of Parliament giving the Stockton-Darlington Company power to work the railway by means of locomotive engines, and to employ them for the haulage of passengers as well as goods. The Act was obtained with some difficulty, against the bitter opposition of a number of powerful peers, such as the Duke of Cleveland, in the session of 1823, when the construction of the railway, under George Stephenson's supervision, was already going on actively. The first rail of the Stockton and Darlington line had been laid, with considerable ceremony, near the town of Stockton, on the 23d of May 1822, and notwithstanding the uninterrupted opposition, frequently growing into acts of personal violence, of hundreds of enemies, backed by the whole mob of the district, the works were pushed on so vigorously, that it was possible to open the line on the day fixed, the 27th of September 1825—eventful day in railway history, well worthy the great "Jubilee" held at Darlington in 1875.

Of the first interview between Stephenson and Pease, very graphic accounts have been given by Mr. Smiles, who had an interview with Mr. Pease in 1854, four years before his death, and when he had reached the patriarchal age of eighty-eight. Hale and hearty, and full of reminiscences of the past, sound in health, with his eye not dimmed or his natural force abated, Mr. Pease narrated many circumstances which the

biographer of the engineers has made full use of. He described the appearance of Stephenson as having "an honest sensible look about him, and so modest and unpretending withal." Stephenson spoke in the strong Northumbrian dialect of his district, and described himself as "only the engine-wright of Killingworth—that's what I am." In the course of the interview Edward Pease said to Mr. Smiles, with much truth—referring to the growth of the trees in front of his house which he had planted as a boy—"Ay, but railways are a far more extraordinary growth even than these. They have grown up not only since I was a boy, but since I was a man. When I started the Stockton and Darlington, some five-and-thirty years since, I was already fifty years old. Nobody would then have dreamt what railways would have grown to in one man's lifetime."

OPENING OF THE RAILWAY.

The 27th day of September 1825 deserves to be marked as a red-letter day in the calendar of the world's history. On that morning the greatest revolution of modern times was to be inaugurated—the painfully slow development of men's ideas up to that point being followed, though not quite immediately, by results which were none the less consequent upon that day's proceedings, that the persons chiefly engaged in the work failed entirely to see what

the future had in store for the world in supplement to the success of the opening. There is something quite characteristic of the fact that men did not foresee what might be the result, in the fact to be subsequently noticed, that provision for passenger accommodation was not made till a fortnight after the railway was ceremoniously declared open.

Tuesday, the 27th of September 1825, was a great day for Darlington. The railway, after having been under construction for more than three years, was at length about to be opened. The project had been the talk of the neighbourhood for so long that there were few people within a range of twenty miles who did not feel more or less interested about it. Was it to be a failure or a success? Opinions were pretty equally divided as to the railway, but as regarded the locomotive the general belief was that it would "never answer." However, there the locomotive was—"No. 1"—delivered on to the line, and ready to draw the first train of waggons on the opening day.

A great concourse of people assembled on the occasion. Some came from Newcastle and Durham, many from the Aucklands, while Darlington held a general holiday and turned out all its population. To give *éclat* to the opening, the directors of the company issued a programme of the proceedings, intimating the times at which the procession of waggons would pass certain points along the line. The

proprietors assembled as early as six in the morning at the Brusselton fixed engine, where the working of the inclined planes was successfully rehearsed. In this trial, as in the subsequent ceremony, a train of waggons laden with coals and merchandise was drawn up the western incline by the fixed engine in seven and a half minutes, and then lowered down the incline on the eastern side of the hill, in five minutes.

In spite of the evil prognostications heard on all sides, the inauguration of the Stockton-Darlington Railway passed over most satisfactorily. The programme issued by the company, dated "Railway Office, September 19th, 1825," was as follows:—

"The Stockton and Darlington Railway Company do hereby give notice, that the formal opening of this railway will take place on the 27th inst., as announced in the public papers. The proprietors will assemble at the Permanent Steam Engine, situated near the Brusselton Tower, about nine miles west of Darlington, at eight o'clock, and, after examining their extensive inclined planes there, will start from the foot of the Brusselton descending plane at nine o'clock in the following order:—

1. The Company's locomotive engine.
2. The engine's tender, with water and coals.
3. Six waggons, laden with coals, merchandise, etc.
4. The committee, and other proprietors, in the coach belonging to the Company.

5. Six waggons with seats reserved for strangers.

6. Fourteen waggons, for the conveyance of workmen and others.

The whole of the above to proceed to Stockton.

7. Six waggons, laden with coals, to leave the procession at the Darlington branch.

8. Six waggons, drawn by horses, for workmen and others.

9. Ditto.

10. Ditto.

11. Ditto.

"The Company's workmen to leave the procession at Darlington, and dine at that place at one o'clock; excepting those to whom tickets are specially given for Yarm, and for whom conveyances will be provided, on their arrival at Stockton.

"Tickets will be given to the workmen who are to dine at Darlington, specifying the houses of entertainment.

"The proprietors, and such of the nobility and gentry as may honour them with their company, will dine precisely at three o'clock, at the Town Hall, Stockton. Such of the party as may incline to return to Darlington that evening, will find conveyances in waiting for their accommodation, to start from the company's wharf there precisely at seven o'clock.

"The company take this opportunity of enjoining on all their work people that attention to *sobriety* and *décorum* which they have hitherto had the pleasure of observing.

"The committee give this public notice, that all persons who shall ride upon, or by the sides of the railway, on horseback, will

incur the penalties imposed by the Acts of Parliament passed relative to this railway."

Appended to the programme was the following footnote:—

"Any individual desirous of seeing the train of waggons descending the inclined plane from Etherley, and in progress to Brusselton, may have an opportunity of so doing, by being on the railway at St. Helen's Auckland, not later than half-past seven o'clock."

At the foot of the Brusselton incline the procession of vehicles was formed, consisting of the locomotive engine, "No. 1," driven by George Stephenson himself; after it six waggons loaded with coals and flour, then a covered coach containing directors and proprietors, next twenty-one coal waggons fitted up for passengers (with which they were crammed), and lastly six more waggons loaded with coals.

Strange to say, a man on a horse, carrying a flag, with the motto of the company inscribed on it, *Periculum privatum utilitas publica*, headed the procession! A lithographic view of the great event, published shortly after, duly exhibits the horseman and his flag. It was not thought so dangerous a place after all. The locomotive was only supposed to be able to go at the rate of from four to six miles an hour; and an ordinary horse could easily keep ahead of that.

Off started the procession, with the horseman at its head. A great concourse of people stood along the line. Many of them

tried to accompany it by running, and some gentlemen on horseback galloped across the fields to keep up with the engine. The railway descending with a gentle incline towards Darlington, the rate of speed was consequently variable. At a favourable part of the road, Stephenson determined to try the speed of the engine, and he called upon the horseman with the flag to get out of the way! Most probably deeming it unnecessary to carry his *Periculum privatum* farther, the horseman turned aside, and Stephenson "put on the steam." The speed was at once raised to twelve miles an hour, and, at a favourable part of the road, to fifteen. The runners on foot, the gentlemen on horseback, and the horseman with the flag, were consequently soon left far behind.

A writer in the *Scots Magazine* gives the following interesting particulars:—

"On Tuesday, that great work, the Darlington and Stockton Railway, was formally opened by the proprietors for the use of the public. It is a single railway of twenty-five miles in length, and will open the London market to the colliers of the western part of the county of Durham, as well as facilitate the obtaining of fuel to the country along its line, and in the northern parts of Yorkshire. The line of railway extends from the collieries in a direction nearly from west to east from Witton Park, and Etherly, near West Auckland, to Stockton-upon-Tees, with branches to Darlington, Yarm,

etc., and is chiefly composed of malleable iron rails. At the western extremity of the line a deep ravine occurs at the river Gaundless, on the summit of the hills, on each side of which, permanent steam-engines are fixed for the purpose of conveying the goods across the two ridges. The engine on the western side of the vale is called the Etherly engine, and that on the eastern side the Brusselton engine; the latter of which, in addition to conveying the goods up from West Auckland, also continues the transit down the eastern side of the ridge; below this, to the east, the country, though undulating, is pretty flat, and the conveyance is performed by locomotive engines. . . .

"The committee, after inspecting the Etherly engine plane, assembled at the bottom of Brusselton engine plane, near West Auckland, and here the carriages loaded with coals and merchandise were drawn up the eastern ridge by the Brusselton engine, a distance of 1960 yards, in seven and a half minutes, and then lowered down the plane on the east side of the hill, 880 yards, in five minutes. At the foot of the plane the locomotive engine was ready to receive the carriages, and here the novelty of the scene and the fineness of the day had attracted an immense concourse of spectators—the fields on each side of the railway being literally covered with ladies and gentlemen on horseback, and pedestrians of all kinds. The train of carriages

was then attached to a locomotive engine of the most improved construction; and built by Mr. George Stephenson, in the following order:—Locomotive engine with the engineer (Mr. Stephenson) and assistants—tender, with coals and water—next, six waggons loaded with coals and flour—then an elegant covered coach, with the committee and other proprietors of the railway—then twenty-one waggons, fitted up on the occasion for passengers—and, last of all, six waggons loaded with coals, making altogether a train of thirty-eight carriages, exclusive of the engine and tender. Tickets were distributed to the number of near 300, for those who, it was intended, should occupy the coach and waggons; but such was the pressure and crowd, that both loaded and empty carriages were instantly filled with passengers. The signal being given, the engine started off with this immense train of carriages, and here the scene became most interesting—the horsemen galloping across the fields to accompany the engine, and the people on foot running on each side of the road endeavouring in vain to keep up with the cavalcade [*sic*]. The railway descending with a gentle inclination towards Darlington, though not uniform, the rate of speed was consequently variable. On this part of the railway it was intended to ascertain at what rate of speed the engine could travel with safety. In some parts the speed was frequently twelve miles per

hour; and in one place, for a short distance, near Darlington, fifteen miles per hour; and at that time the number of passengers were counted to 450, which, together with the coals, merchandise, and carriages, would amount to near ninety tons. After some little delay in arranging the procession, the engine, with her load, arrived at Darlington, a distance of eight miles and three-quarters, in sixty-five minutes, exclusive of stops, averaging about eight miles an hour. Six carriages loaded with coals, intended for Darlington, were then left behind; and after obtaining a fresh supply of water, and arranging the procession to accommodate a band of music and passengers from Darlington, the engine set off again. Part of the railway from Darlington to Stockton has little declivity, and in one place is quite level; and, as in the upper part it was intended to try the speed of the engine, in this part it was intended to prove her capability of dragging a heavy load, and certainly the performance excited the astonishment of all present, and exceeded the most sanguine expectations of every one conversant with the subject. The engine arrived at Stockton in three hours and seven minutes after leaving Darlington, including stops, the distance being nearly twelve miles, which is at the rate of four miles an hour; and upon the level part of the railway the passengers in the waggons were counted at about 550, and several more clung to the carriages on

both sides, so that the whole number could not be less than 600, which, with the other load, would amount to about eighty tons.

"Nothing could exceed the beauty and grandeur of the scene. Throughout the whole distance, the fields and lanes were covered with elegantly dressed ladies, and all descriptions of spectators. The bridges, under which the procession, in some places, darted with astonishing rapidity, were lined with spectators cheering and waving their hats, which had a grand effect. At Darlington the whole inhabitants of the town were out to witness the procession. But though all along the line people on foot crowded the fields on each side, and here and there a lady or gentleman on horseback, yet the cavalcade was not joined by many horses and carriages until it approached within a few miles of Stockton; and here the situation of the railway, which runs parallel and close to the turnpike road leading from Darlington to Yarm and Stockton, gave them a fine opportunity of viewing the procession. Numerous horses, carriages, gigs, carts, and other vehicles, travelled along with the engine and her immense train of carriages, in some places within a few yards, without the horses seeming the least frightened; and at one time, the passengers by the engine had the pleasure of accompanying and cheering their brother passengers by the stage coach which passed alongside, and of

observing the striking contrast exhibited by the power of the engine and horses—the engine with her six hundred passengers and load, and the coach with four horses and only sixteen passengers.

"In contemplating the events of the day, either in a natural point of view, or as the efforts of a company of individuals furnishing a speedy, efficacious, and certain means of traffic to a wide and extended district, it alike excites the deepest interest and admiration; and the immense train of carriages covered with people, forming a load of from eighty to ninety tons, gliding, as it were, smoothly and majestically along the railway, through files of spectators, at such an astonishing rate of speed, left an impression on those who witnessed it, that never will be forgotten. Part of the workmen were entertained at Stockton, and part at Yarm, and there was a grand dinner for the proprietors and their most distinguished guests at the Town Hall, in Stockton. Mr. Meynell, of Yarm, was in the chair, and the Mayor of the town acted as vice-president." [Mr. Meynell, who was chairman of the railway, wrote a very interesting record of the day's proceedings, after his return home: this description was read by Mr. Henry Pease at the jubilee dinner in 1875.]

All this, however, was mere gala work. The serious business of the company began on the following day. Upon the result of the experiment now fairly ini-

tiated by the Stockton and Darlington Company the future of railways in a great measure depended. If it failed, like the Wandsworth, Croydon, and Mersham undertaking, then a great check would unquestionably be given to speculation in railways. If it succeeded, the Stockton and Darlington enterprise would mark the beginning of a new era, and issue in neither more nor less than a complete revolution of the means of communication in all civilised countries.

The circumstances were on the whole favourable, and boded success rather than failure. Prudent, careful, thoughtful men were at the head of the concern, interested in seeing it managed economically and efficiently; and they had the advantage of the assistance of an engineer possessed of large resources of mother wit, mechanical genius, and strong common sense. There was an almost unlimited traffic in coal to be carried, the principal difficulty being in accommodating it satisfactorily. Yet it was only after the line had been at work for some time that the extensive character of the coal traffic began to be appreciated. At first it was supposed that the chief trade would be in coal for land sale. It was estimated that only about 10,000 tons a year would be shipped, and that principally by way of ballast. Instead of which, in the course of a very few years, the coal carried on the line for export constituted the main bulk of the traffic, whilst

that carried for land sale was merely subsidiary.

The Corporation of the borough of Stockton, though they had welcomed the railway to their port, acted in a very short-sighted manner as regarded the accommodation of the traffic which it brought. The Stockton quays were limited and inconvenient, and though the heavy dues must eventually have produced a large income to the town, the Corporation made no efforts to provide for the increased trade; and the Stockton and Darlington Company were accordingly compelled to provide for themselves elsewhere. Some of the directors proceeded to purchase the site of a new shipping place on the Tees, a few miles below Stockton, where they erected staiths and provided other conveniences for the speedy loading of coal. This site consisted of about 500 acres of land, the only building standing on it at the time being an isolated farmhouse. All round it was green fields, and along the river mud banks. Before long buildings were erected, and the town of Middlesbrough sprang up as if by magic—a thriving place now, containing 25,000 inhabitants, provided with churches, public institutions, banks, shipbuilding yards, iron-foundries, docks, and all the appurtenances of a great commercial and manufacturing seaport; thus proving the truth of what Edward Pease had so often predicted, that “If they will only let us make the railroads,

the railroads will make the country."

Although only George Stephenson's name is mentioned as the driver of the locomotive "No. 1," his principal helper, Mr. William Huntley, who still (1877) lives, deserves some notice. Mr. Huntley, who was born at Acklington in 1798, was ten years in the employment of Stephenson and Co., and superintended the erection of the "first locomotive." On the opening day, he drove it in turn with George Stephenson. Huntley afterwards erected the first locomotive that drew a passenger train in Scotland, in 1831, and since that period he has been connected with the railway system

at Dundee. As we write, Mr. Huntley, has attracted attention by his "continuous grip-brake," for stopping trains at high speed, for which he has decided not to take out a patent, presenting it freely to the consideration of the railway world.

OPENING FOR REGULAR PASSENGER TRAFFIC.

There were, as already stated, no carriages provided for the conveyance of passengers on the line at first; but as the demand for conveyance grew, arrangements were made to run a special "coach," in terms of the following handbill:—

Stockton and Darlington Railway.

THE COMPANY'S COACH,

CALLED

'THE EXPERIMENT.'

Which commenced Travelling on MONDAY, the 10th OCTOBER, 1825, will continue to run from *Darlington* to *Stockton*, and from *Stockton* to *Darlington* every Day [Sundays excepted], setting off from the DEPOT at each place, at the times specified as under (*viz.*)—

ON MONDAY,

From Stockton at half-past 7 in the Morning, and will reach Darlington about half-past 9; the coach will set off from the latter place on its return at 3 in the Afternoon, and reach Stockton about 5.

TUESDAY,

From Stockton at 3 in the Afternoon, and will reach Darlington about 5.

On the following Days, viz.—

WEDNESDAY, THURSDAY, & FRIDAY,

From Darlington at Half-past 7 in the Morning, and will reach Stockton about half-past 9; the Coach will set off from the latter place on its return at 3 in the Afternoon, and reach Darlington about 5.

SATURDAY,

From Darlington at 1 in the Afternoon, and will reach Stockton about 3.

Passengers to pay 1s. each, and will be allowed a Package of not exceeding 14 lbs. ; all above that weight to pay at the rate of 2d. per Stone extra. Carriage of small Parcels 3d. each. The Company will not be accountable for Parcels of above £5 Value, unless paid for as such.

Mr. RICHARD PICKERSGILL at his Office in Commercial Street, Darlington ; and Mr. TULLY at Stockton, will for the present receive any Parcels and Book Passengers.

Though a thing of only forty years ago, the original style of travelling by coach on the Stockton and Darlington has already become antiquarian in its character, and it is, indeed, one of the very few bits of antiquity that railways have to boast of.

Some eighty years since there was only one post-chaise in Darlington, and it ran on three wheels. There are people still living who remember when a coach ran from Stockton three days in the week, passing through Darlington and Barnard Castle ; but it was starved off the road for want of support. There was then very little intercourse between the towns, though they were so close to each other, and comparatively so populous. When the railway was nearly ready for opening, the running of a stage coach on the line was thought worthy of a trial, and a coach was ordered to be made called 'The Experiment.' This coach very much resembled a showman's caravan, with three small windows on each side, seated all round, and a long deal table in the middle. The entrance to the caravan was by a door at the back

end. It was drawn by one horse, which made the journey of twelve miles between the two towns in about two hours. There was only one class of passengers, and the fare charged was a shilling.

'The Experiment' filled very well—so well that it sometimes could not contain half the passengers who presented themselves. When it was heavily laden, the one horse could with difficulty draw it, especially on the return journey from Stockton to Darlington, where the gradient was all up-hill. It was accordingly determined to banish the lumbering caravan to the coal districts of the west, and to employ a new kind of vehicle for the better accommodation of the traffic between Stockton and Darlington. A number of old stage-coach bodies were bought and mounted on underframes with flange wheels. These coaches were let to contractors, who horsed and worked them, paying certain agreed tolls to the company. The outside fares were a shilling for the twelve miles, and the inside fares two shillings. From fifteen to twenty persons could contrive to seat themselves

outside, the inside passengers being limited to six.

The speed of the new coaches was raised to about ten miles an hour; and two journeys were made daily between Darlington and Stockton and back. When the coach drew near to any bend in the road at which the view was obstructed, the coachman blew a horn to give warning of his approach to the driver of any waggon coming from the opposite direction. The road being as yet only single, there were passing places provided, into which the coming vehicles were drawn to enable the proceeding coach readily to pass. Sometimes it happened that the coaches met on the single line between two passings, and then an altercation would arise between the drivers as to which should turn back. When an agreement was come to, one of the coachmen unyoked his horse, re-yoked him to the opposite end, and drew the vehicle back to the next passing place, to allow the other to proceed.

A writer in the *Caledonian Mercury* of the time described in glowing terms the wonders of this new mode of conveyance. "Nothing appeared more surprising," observed the writer, "than the rapidity and smoothness of the motion, considering that the coach had no springs, and also the ease with which the animal drew his load. We left Darlington with thirteen outside passengers, and two or three inside, and picked up various others on the way. In

regard to passengers, the coach appears to be no way limited in its numbers. The coachman informed us that one day lately, during the time of the Stockton races, he took up from Stockton nine inside and thirty-seven outside, in all forty-six. Of these some were seated all round the top of the coach on the outside, others stood crowded together in a maze at the top, and the remainder clung to any part where they could get a footing. On that occasion he had two horses. . . . Such is the first attempt to establish the use of railways for the general purposes of travelling, and such is the success with which it has been attended that the traffic in this way is already great; and, considering that there was formerly no coach at all on either of the roads along which the railway runs parallel, it is really quite wonderful; its trade and intercourse has arisen out of nothing—nobody knows how. It was unlooked for even by the promoters of the railway themselves, who now draw at the rate of £400 or £500 a year from the coaches alone; and, altogether, the circumstances of bustle and activity which now appear along the line, with the crowds of passengers going and returning, form a matter of surprise to the whole neighbourhood as well as to the public."

[For much of the above interesting description of the origin and opening of the Stockton and Darlington Railway, we are indebted to the "Jubilee" numbers of the

Railway News, to whose editor we owe an acknowledgment for courteously permitting the use of the articles.]

FIRST LOCOMOTIVE RAILWAYS IN SCOTLAND.

In 1824 an Act was obtained for the construction of the Monkland and Kirkintilloch Railway, from Palace Craig in Lanarkshire, to the banks of the canal at Kirkintilloch, in Dumbartonshire. The line was completed and opened a year after the Stockton and Darlington, namely in September 1826, and was at first used only for the conveyance of coal for shipment at the canal. The waggons were drawn by steam-locomotives. As it was found that passenger traffic could be cultivated, the directors, early in 1827, added to most of the coal trains a coach for the conveyance of passengers, with considerable profit to the company. The Ballochney Railway, opened in 1828, also had some of its trains drawn by locomotives, and here too, the addition of a passenger carriage proved a source of convenience to the public and of profit to the company.

THE CANTERBURY AND WHITSTABLE.

This was the fourth completed line in the kingdom which used locomotives and carried passengers, and perhaps from the fact that it did not, any more than the two

Scotch lines above named, attract much public attention, its story is deserving of record now. The Act for the formation of the line was got in 1825, and with a capital of £35,000, it was proposed to make a line six and a quarter miles long, with heavy gradients, and a tunnel half-a-mile long. This proved inadequate, and subsequent Acts were obtained in 1827 and 1828 to raise new capital. As even these additions proved too little, loans and mortgages were resorted to, and it was only in May 1830 that the public opening took place. Worked on a series of inclined planes, partly by locomotives and partly with fixed engines, the Canterbury and Whitstable Railway was a sufficiently remarkable undertaking to attract public curiosity; still the event of its opening was disposed of briefly in the newspapers, as a thing of no more importance than the making of a few miles of ordinary road. It was, in fact, left to the Liverpool and Manchester line, which was opened four months later (Sept. 15th) to arouse the press and the public to the fact that there was in existence a process for conveying passengers and goods along the surface of the earth immensely superior to anything known in the world's history. The use of locomotive engines both for passengers and goods was a process fully established. Two lines of railway in England and two in Scotland were daily proving its enormous value, yet the reports of the inauguration of the railway

connecting the great port of Liverpool, with the manufacturing centres of Lancashire—perhaps not less by the success of the proceedings than by the tragic death of a popular statesman by which they were saddened—were the first to open the eyes of the nation and the world to the fact that the advent of the iron horse was about to revolutionise not only travelling but trade, and to bring to light a new power which, whether for peace or war, was to distance and displace all existing methods of conveyance, and bring about a new social era.

THE LIVERPOOL AND MANCHESTER LINE.

It is of interest to recur to the fact, at this point of our narrative, that the Bridgewater canals indirectly led to the promotion of the railway system. In reference to this we may quote the remarks of a writer in the *Quarterly Review*, by whom the growth and improvement in modes of travel, as well as the possible fate of railways themselves, are at the same time depicted:—

“The gentlemen of Liverpool and Manchester, who originated the railway between these towns, well understand that one effect of the peculiar disposition of the Duke of Bridgewater for the management of his canal property after his death, was to accelerate the introduction of ‘those — tram-roads,’ in which his sagacity taught him to foresee dangerous rivals to

his liquid highway. In 1829 the time was doubtless ripe for the introduction of that wonderful contrivance the locomotive engine; and, from obvious local circumstances, it was almost inevitable that Liverpool and Manchester should take the lead in its adoption. The fact is nevertheless notorious, that the manner in which irresponsible power had for some time been exercised with reference to the public, in the management of the Bridgewater line of navigation, accelerated a crisis, which, under other circumstances, might, for a time, have been delayed.

“Great fear and confusion of mind fell upon canal proprietors. The invention, which, in the opinion of many practical men, was to supersede their craft, started, like Minerva full armed, from the brains of its various contrivers. Few machines in the records of human ingenuity have attained such early perfection as the locomotive engine. It placed the powers of fire at once at issue with those of water:—

Old Father Thames reared up his
reverend head,
And feared the fate of Simois
would return:
Deep in his sedge he sought his oozy
bed,
And half his waters shrunk into his
urn.

It was vain to raise the cry,
‘Great is Diana of the Ephesians.’
The progress of anterior improvements was appealed to, and with justice. The Yorkshire fox-hunter

going to or returning from his sport will occasionally find himself on a flagged pathway, flanked on either side with an abyss of mud, and only wide enough to admit of progress in single file. This is the packhorse road of our ancestors, and except the occasional semblance of the animal itself, with its load displayed on village signs, things as retentive of sad bygone facts as the picture writing of the Mexicans, is now the only memorial of a mode of communication which, in the memory of man, was hardly superseded by the waggon and the coach. The latter machines doubtless still survive, but many a tinkling peal of bells was silenced, many a set of dock-tailed horses, with their accoutrements of tinted worsted, put in abeyance by Brindley, as many a four-horse coach has since been slapped into flies and station omnibuses by the harlequin wands of the Brunels and Stephensons. Even their inventions begin to tremble. We can hardly expect that in our time the disembodied spirit of Bishop Wilkins, if it revisit the glimpses of the luminary it proposed, while in the body, to invade, will be gratified by the triumph of some aerial machine over the railroad. He must be a bold man, however, who would now predict how long the capital vested in the present system of railroads may continue undisturbed and unaffected by some new application of power. While we write it is possible that nothing but the mass of the investment, and the pre-occupation of lines of

country (and even these are but feeble impediments to British enterprise and ingenuity) prevent it from being so interfered with by the atmospheric railroad. Perhaps some still simpler scheme of galvanism, or gaseous explosion, is fermenting in the cranium of some unknown mechanician, which may supplant the invention of Watt. Of the relative prospects, then, of railroad and water carriage it would be presumptuous to speak; but some dozen years of experience enable us to say that there is an inherent force of vitality in the latter which will at least secure it an honourable death, and respect from its conquerors."

Application was made to Parliament for leave to lay down a railway from Liverpool to Manchester—a work then become indispensable to those two increasing and important towns. At that period, and for some time afterwards, canal boats, and slow, heavy road waggons were the only available means for the transport of heavy goods or bulky merchandise. The charge for conveyance from London to Yorkshire amounted frequently to £13 per ton, and even at this high cost the service was very imperfect. Beneficial as canals had proved, they were becoming inadequate to the growing requirements of trade. Besides the road there were two canals for the traffic between Liverpool and Manchester, the distance by the latter fifty-five miles, and the carriage of goods in some instances £2 per ton. Manchester was so entirely dependent

on Liverpool that better accommodation became a necessity. Another canal could not be made, so a railway was projected; and the prospectus being issued in 1824, an Act was obtained, after failure in the session of 1825, in the year 1826.

It was the intention of its projectors to run the carriages upon it at a high rate of speed. To do this with horses was expensive; and to work it by steam power, it was supposed that stationary engines would be required at short intervals along the road, to draw the trains by ropes from one station to another. While the necessity for the projected railway was admitted on all hands, the idea of its being worked by locomotives at a speed exceeding eight or nine miles an hour was ridiculed. And when George Stephenson stated that he could make the locomotive travel at the rate of twenty miles an hour, it was received with incredulity, and doubts were whispered as to his sanity. A reviewer in the *Quarterly* stated that nothing could be more palpably absurd than the prospect held out of locomotives travelling twice as fast as stage coaches, and that people would as soon suffer themselves to be fired off upon one of Congreve's *ricochet* rockets as trust themselves to the mercy of a machine going at such a rate. When examined before a parliamentary committee, Stephenson's estimate of speed caused one member of the committee to remark that the engineer could

only be fit for a lunatic asylum. The following case was put before Stephenson:—"Suppose, now, one of those engines to be going along a railroad at the rate of nine or ten miles an hour, and that a cow were to stray upon the line and get in the way of the engine, would not that, think you, be a very awkward circumstance?" "Yes," replied the witness, with a twinkle in his eye, "very awkward indeed—for the cow!" The honourable member did not proceed farther with his cross-examination; and, says Mr. Smiles, "to use a railway phrase, he was *shunted*."

THE LOCOMOTIVE COMPETITION.

A premium of £500 was at length offered for the best engine, one that should not produce smoke, should draw three times its own weight, for thirty miles, at the rate of ten miles an hour, should be supported on springs, should not weigh more than six tons, and should not cost more than £550. At the time appointed, four locomotives were presented for trial, and the competition took place on the 6th of October 1829, before many thousand spectators. One of the competing engines, the 'Perseverance,' made by Mr. Burstall, being found unable to move at more than five or six miles an hour, was withdrawn. Another, called the 'Novelty,' made by Messrs. Braithwaite and Ericsson, was unable to complete the trial owing to the bellows for creating the blast having given way. A third, called the 'Sanspareil,' sub-

mitted by Mr. Hackworth, succeeded in drawing a load at the rate of fourteen miles an hour ; but at its eighth trip along the two-mile level which formed the course the cold water pump got wrong, and it could proceed no farther. The 'Rocket,' made by George Stephenson, however, made an experimental trip of twelve miles, which was performed without accident in about 53 minutes.

Another day was fixed for the final trial of the competing engines ; and on the morning of the 8th of October the 'Rocket' was again ready for the contest. "On that occasion," says Mr. Smiles, "the engine was taken to the extremity of the stage, the firebox was filled with coke, the firelighted, and the steam raised until it lifted the safety-valve, loaded to a pressure of 50 lbs. to the square inch. This proceeding occupied fifty-seven minutes. The engine then started on its journey, dragging after it about thirteen tons weight in waggons, and made the first ten trips, backwards and forwards along the two miles of road, running the thirty-five miles, including stoppages, in an hour and forty-eight minutes. The second ten trips were in like manner performed in two hours and three minutes. The maximum velocity attained during the trial trip was twenty-nine miles an hour, or about three times the speed that one of the judges of the competition had declared to be the limit of possibility ! The average speed at which the whole of the jour-

neys were performed was fifteen miles an hour, and five miles beyond the rate specified in the conditions published by the company. The entire performance excited the greatest astonishment amongst the assembled spectators. The directors felt confident that their enterprise was now on the eve of success ; and George Stephenson rejoiced to think that, in spite of all false prophets and fickle counsellors, his locomotive system was safe. When the 'Rocket,' having performed all the conditions of the contest, arrived at the "grand stand" at the close of its day's successful run, Mr. Cropper, one of the directors favourable to the fixed-engine system, lifted up his hands and exclaimed, "Now has George Stephenson at last delivered himself." This interesting engine, the parent of the locomotives at present in use, is still to be seen in the Patent Museum at South Kensington.

The prize of £500 was at once awarded to the maker of the 'Rocket.' The engine was not only remarkable for its speed, but also for the contrivances by which that speed was attained. Most important among them was the introduction of tubes passing from end to end of the boiler—said to have been suggested by Mr. Booth, secretary to the company—by means of which so great an additional surface was exposed to the heat of the fire, that steam was generated much more rapidly, and a higher temperature maintained at a smaller expenditure of

fuel than usual. The tubular boiler was indeed the grand fact of the experiment. Without tubes steam could never have been produced with the rapidity and heat essential to quick locomotion; and by burning coke instead of coal, the stipulated suppression of smoke was effected. The quantity of fuel consumed by the 'Rocket' during the experiment was half a ton; the coke and water being carried in a tender attached to the engine.

OPENING OF THE LINE.

The opening of this railway was celebrated with even more pomp and display than had been exhibited five years before at Darlington. A letter from George Stephenson to Charles Knight, the great promoter of cheap literature, appeared in the *Companion to the British Almanac* for 1829, and directed public attention in a very marked manner to some of the more prominent engineering difficulties which had been overcome in the construction of the line. Reserving to a later page a notice of some of those difficulties, it may be sufficient here to state that a subsequent letter from Stephenson which appeared in the *Companion* a year later, intimated that the works were so far advanced that the line might be ready for opening on 1st January 1830. A desire to secure greater prominence to the event postponed the opening to a later date, and it was not till the 15th

of September that the inauguration took place.

Some efforts had been made to secure the presence of the King on the occasion, but the sovereign was not disposed to undertake such a long journey. To an age familiar with royal saloon carriages, special trains, and rapid royal progresses from far Southampton or Exeter to the *Ultima Thule* of Thurso and Wick, the reluctance of the king to take part in this great event may not appear so excusable as it perhaps did to his subjects about fifty years ago. Want of faith in the safety of the steam horse was alleged as one reason of the king's refusal, but in all probability it was the fatigue of the long journey that really made him decline to be present on the occasion, joined perhaps to the absence of interest in a project of which, though it was destined to have so great an effect on the prosperity of the country, even wiser men than the sovereign failed to perceive the real meaning. Through the influence of Mr. Huskisson, one of the Members for Liverpool, the Duke of Wellington, who then held the office of Prime Minister, was induced to grace the event with his presence, as did also Sir Robert Peel (Home Secretary), Mr. Huskisson, and a party of distinguished people. Thirty-three carriages, drawn by eight engines, started from Liverpool amidst the greatest enthusiasm of a large crowd of spectators. The first train, drawn by the 'North-

umbrian,' an engine of 14 horsepower, consisted of three carriages, that prepared for the Duke of Wellington being handsomely decorated. This train moved off on one line of rails, while the other trains, consisting of twenty-eight carriages, and conveying in all about 600 people, moved on the other line. To one who studies in detail the history of railway progress, the *personnel* of the drivers of the engines on this memorable occasion becomes a matter of no slight interest. The first engine, the 'Northumbrian,' was driven by old George Stephenson; then came the 'Phoenix,' driven by his no less distinguished son, Robert; then the 'Rocket,' driven by Joseph Locke; the 'Comet' by Alcard; the 'Dart' by Thomas Gooch; and the 'Arrow' by Frederic Swanwick.

The passenger carriages of that day were simply stage-coach bodies fixed on a frame, and to a very late period the interior arrangements closely resembled these coaches. The looped straps at each side of the door used by the "four insides" of the mail to steady themselves in the jolting of the coach still survive and to a late period the ample pockets in the inside of the coach door also remained to remind us how closely the carriages were made to resemble the coaches they had so signally displaced. A coloured print published by Ackermann about the time of the opening of this line shows the three-bodied 'Marquis of Stafford' carriage, with

yellow painted panels, in the old style, and ladies in coal-scuttle bonnets sitting at the windows.

The leading train stopped at Parkside, about seventeen miles from Manchester, to take in water for the engines, when a gloom was cast over the proceedings by the occurrence of the

FIRST RAILWAY ACCIDENT.

While the train was standing Mr. Huskisson and others left the carriages, and he was walking up the line, it is believed, to speak to the duke, who held out his hand to him, when one of the trains upon the other line of rails came up. All the passengers ran clear of the advancing train, which was that drawn by the 'Rocket,' driven by Robert Stephenson. The cry of "Get in, get in," was raised; and Mr. Huskisson appears to have been confused by the cries, and endeavoured to clamber up into his carriage. The line was constructed, not with the "six-foot" between the up and down rails, as is invariably now done, but with a space of four feet only, and the carriages, overhanging the rails, left a space of eighteen inches only between the vehicles of one train and those of another. Mr. Huskisson attempted to climb into the carriage in which he had been seated. Unfortunately the door swung back, and he fell off, and, falling on the line in front of the advancing carriages, he was run over, his thigh being fractured, and his body otherwise mangled.

He at once exclaimed, "I have met my death;" and this proved a true augury, by his death nine hours afterwards within the parsonage of Eccles, to which he was conveyed. The train proceeded to Manchester without further impediment, but the accident had the effect of marring all the contem-

plated festivities. Was it a portent of the fact, which all experience has verified, that the greatest railway triumphs have been marred by grievous loss of life? Mr. Huskisson, who thus came to an untimely end, was one of the principal promoters of the Liverpool and Manchester line.





CHAPTER II.

Is there no nook of English ground secure
From rash assault?

And must he, too, his old delights disown
Who scorns a false utilitarian lure
'Mid his paternal fields at random thrown?

Speak, passing winds; ye torrents, with your strong
And constant voices, protest against the wrong!

Wordsworth.

PUBLIC OPINION ON RAILWAYS—OBJECTIONS TO RAILWAYS—PRACTICAL
FORMS OF OBJECTION—OPPOSITION IN THE PRESS—OPPOSITION
FROM CANAL PROPRIETORS—EARLY OPINION IN FAVOUR OF
RAILWAYS—CHARLES MACLAREN ON RAILWAYS—REALISATION OF
MR. MACLAREN'S SPECULATIONS—FAVOURABLE IMPRESSIONS OF
THE RAILWAY—GROWTH IN PUBLIC FAVOUR.

PUBLIC OPINION ON RAILWAYS.

MIDWAY between the record of the rise of the earliest of railways, and of the marvellous development which this method of travelling has received in our own day, an interesting chapter can be given on the expressions of public opinion, favourable or the reverse, which greeted the system in its earlier years. It was something for the opponents of railways to obtain for their side of the controversy the help of the most distinguished philosophical poet of his day, when the Laureate penned at Rydal Mount the lines of which a portion appears at the head of this chapter, on learning that it was contemplated to construct a branch line from Kendal to Windermere.

The ranks of objectors from the poetic or æsthetic point of view as well as the economic, have also been joined by the clever and incisive essayist John Ruskin, who, amongst many other sayings of like import, has expressed his views on railways in the following words:—

“Going by railroad I do not consider as travelling at all; it is merely ‘being sent’ to a place, and very little different from becoming a parcel; the next step to it would, of course, be telegraphic transport, of which, however, I suppose it has been truly said by Octave Feuillet—

*‘Il y aurait des gens assez bêtes
pour trouver ça amusant.’*

“If we walk more than ten or

twelve miles it breaks up the day too much, leaving no time for stopping at the stream-sides or shady banks, or for any work at the end of the day ; besides that the last few miles are apt to be done in a hurry, and may then be considered as lost ground. But if, advancing thus slowly, after some days we approach any more interesting scenery, every yard of the changeful ground becomes precious and piquant ; and the continual increase of hope and of surrounding beauty affords one of the most exquisite enjoyments possible to a healthy mind. A man who really loves travelling would as soon consent to pack a day of such happiness into an hour of railroad, as one who loved eating would agree, if it were possible, to concentrate his dinner into a pill."

In another part of the same chapter of his *Modern Painters*, Mr. Ruskin observes : — " No changing of place at a hundred miles an hour, nor making of stuff a thousand yards a minute, will make us one whit stronger, happier, or wiser. There was always more in the world than men could see, walked they ever so slowly ; and they will see if no better for going fast. And they will at last, and soon too, find out that their grand inventions for conquering (as they think) space and time, do, in reality, conquer nothing ; for space and time are, in their own essence, unconquerable ; and besides, they did not want any sort of conquering, they wanted *using*. A fool always

wants to shorten space and time ; a wise man wants to lengthen both. A fool wants to kill space and kill time ; a wise man, first to gain them, then to animate them. Your railroad, when you come to understand it, is only a device for making the world smaller ; and, as for being able to talk from place to place, that is, indeed, well and convenient ; but suppose you have, originally, nothing to say, we shall be obliged at last to confess, what we should long ago have known, that the really precious things are thought and sight, not pace. It does a bullet no good to go fast ; and a man, if he be truly a man, no harm to go slow ; for his glory is not at all in going, but in being. ' Well, but railroads and telegraphs are so useful for communicating knowledge to savage nations.' Yes, if you have any to give them. If you know nothing *but* railroads, and can communicate nothing but aqueous vapour and gunpowder,—what then ? But if you have any other thing than those to give, then the railroad is of use only because it communicates that other thing ; and the question is,—what that other thing may be."

More recently Mr. Ruskin has published a strong counterblast against railways in some pithy articles in *Fors Clavigera*, which have, however, amused the world much more than they have convinced it that railways are a mistake.

But it is of earlier obstructions and objections to the railway system

that we propose here to speak. Allusion has already been made to questions put, and remarks made, when George Stephenson was under examination in Parliament with reference to the Stockton and Darlington line. Without stating them in any historical sequence, we may quote a few of the

OBJECTIONS TO RAILWAYS.

One class of those objectors took the form of personal interest, as in the case of the fox-cover of the Duke of Cleveland, which in 1823 were so nearly fatal to the Stockton and Darlington bill, that people recognised a remarkable instance of the "whirligig of time bringing about its revenges," when a later Duke of Cleveland unveiled the statue to Joseph Pease at Darlington and took an active part in celebrating the jubilee of the line his father had so keenly opposed.

The railways of a later date than the Stockton and Darlington had much to contend with in the shape of opposition from landowners and others, who opposed railway bills in many cases "for terms," and ceased their opposition when good terms were secured. An illustration of this is afforded in the promotion of the London and Birmingham line—the third great landmark of early railway history—when the sum of £250,000 estimated as the cost of land when the bill was promoted (and *lost*) in 1832, rose to £750,000 in the following session when the bill was *passed*. The additional

half-million was simply the sum with which opposing landlords had been bought off, receiving this sum for leave to construct a system of communication which was greatly to enhance the value of every estate through or near which it passed.

In many cases, however, opposition did not arise from mercenary motives, but from actual dislike and disbelief as to the railway, and particularly as to the locomotive.

Sir Isaac Coffin distinguished himself by the violence of his opposition to railways. When the Liverpool and Manchester bill was before Parliament in 1825, he asked the house in an impressive manner, if it was aware of "the smoke and the noise, the hiss and the whirl, which locomotive engines, passing at the rate of ten or twelve miles an hour, would occasion? Neither the cattle ploughing in the fields nor grazing in the meadows could behold them without dismay. Iron would be raised in price 100 per cent, or more probably exhausted altogether. It would be the greatest nuisance, the most complete disturbance of quiet and comfort, in the kingdom, that the ingenuity of man could invent." When he further asked the House of Commons "how any person would like to have a railroad under his parlour window?"—the appeal to their fears and dislikes was complete. In this speech he also expressed the opinion that "the beauty and comfort of a gentleman's estates would be destroyed by a railway."

That railways would destroy fox-hunting was a settled opinion with many, and on this subject Mr. Henry Berkeley said—"Nothing is more distasteful to me than to hear the echo of our hills reverberating with the noise of hissing railroad engines, running through the heart of our hunting country, and destroying that noble sport to which I have been accustomed from my childhood."

Col. Sibthorpe, whose peculiar figure and peculiar views made him for so many years the subject of caricature in *Punch*, expressed himself strongly against railways. He denounced them as "dangerous and delusive speculations," as "unsatisfactory and unknown to the constitution of the country;" and said, "I hate the very name of a railway—I hate it as I hate the devil!" Of course those who made railways were equally the objects of his aversion, and he fulminated against railway-engineers in the following characteristic words:—"I would rather meet a highwayman or see a burglar on my premises than an engineer; he would be much more safe, and of the two classes I think the former more respectable."

It may be noticed as a remarkable circumstance that the fear of horses working near a line of railway being startled has little or no place in those early objections, though it forms the principal ground for objecting to the use of steam on the tramways of forty years later.

PRACTICAL FORMS OF OBJECTION.

Sometimes the opposition to railways took an amusingly practical turn, persons determining never to travel by the hated conveyance:—

For example, it is recorded of Mr. Gurney (of Gurney's Bank), that in 1842 he declared—"I have never travelled by rails; I am an enemy to them; I have opposed the Norwich railway, and have left a sum of money in my will to oppose railroads!" To the curious it might be interesting to inquire how the sum of money thus devised—if the will was not altered by a later document—has been expended.

Still more directly practical was the conduct of a public man described by a writer in *Blackwood's Magazine* for December 1876, to whom the circumstances were personally known. The person referred to is described as "one of the strong-minded persons ever proclaiming to the world that they are never beaten, and he tested the invincibility of his character by a resolution to continue posting up to his parliamentary duties from Scotland to town. In some places he found the old road not merely neglected or obliterated, but enclosed, ploughed up and cropped up. His perfectly equipped posting chaise soon sank in fragments under hardships and vicissitudes. Occasionally it was an alternative to our potentate either to accept of hospitality in some labourer's cottage, or be conveyed to the

nearest place of public entertainment in the cart that conveyed the manure to the fields. The great hotels, with their well-stored cellars and army of obsequious attendants, had disappeared. If an inn sufficiently maintained for the members of the farmer's club remained, it was well; but it happened on one occasion the inheritor of the wealth and honours of an ancient line had to herd under the same roof as pedlars, showmen, and vagrants. On the whole, perhaps, none of the members of the class thus thrown in his way had ever endured as much hardship and humiliation in their tramping career as their meteoric visitor had on the occasion that brought them together. He resented the whole affair as something like a personal insult, and freely communicated his griefs among his friends. One of these was Francis Jeffrey, who was not sympathetic, but moralised on the adventure as one of the curious and instructive phenomena that attend on uncompleted social evolutions. It happened that when I last beheld the son of the unfortunate potentate, and the inheritor of his honours, estate, and temper, his amiable face appeared at the window of a first-class carriage, of which he was the sole occupant."

In the history of railway surveying, numerous anecdotes are told of fights between the surveyors and the owners of land, of actions for trespass or assault, arising from encroachments on ground to which

access had been forbidden, of banners or sheets of cloth being held up to intercept the view between theodolite and levelling-staff, of a survey made of the ground of a clergyman, while he was reading the service on Sunday, and even of surveys made at night, by the aid of dark lanterns, over ground to which access could be obtained at no other time!

Leaving what may be called the personal or serious sentimental side of the question, objections to the railway on physical or other grounds may be noticed. For example, it was urged that on principle railways should be opposed, because if iron roads were substituted for stone ones, they would render useless the 27,000 miles of turnpike roads in Great Britain, as well as other public or cross roads of equal or greater extent.¹ It is stated that the London and Birmingham line was compelled to change its projected route in the neighbourhood of Northampton, because the people of the town thought the smoke would injure the fleeces of the sheep! As Northampton is not an agricultural town, but the headquarters of the leather trade, this

¹ In the *Manchester Courier* for 10th March 1876 was published a curious "List of Coaches, Vans, and Waggon's which ceased to travel on the Manchester and Buxton Road from August 25th 1836, to August 24th 1837." This document had been compiled by the keeper of the Longsight Tollbar, to show the loss sustained by the lessees of the Longsight, Rushford, Stockport Moor, and Whaley tolls, through the

shifting of the smoke—in reality there was no smoke to shift, as the locomotives burn coke—but the shifting of the supposed smoke a little more into her agricultural neighbourhood was purely disinterested! Of the same railway it was projected that its works would soon become ruins for the antiquary to study, that every valley on the route would be filled with falling bridges and ruined viaducts. On the medical question, it was alleged that the tunnels would prove peculiarly dangerous in producing colds and catarrhs, and that the deafening noise, the gloom, the glare of the locomotive, and a multitude of other terrors, would make the journey intoler-

opening of the Manchester and Birmingham Railway ;—

<i>Name.</i>	<i>Destination.</i>	<i>Ceased.</i>
Royal Bruce	London	July 8th.
Estaffe	Do.	July 6th.
Bee Hive	Do.	June 18th.
Reindeer	Do.	May 8th.
Railway	Birmingham	Sept. 17th.
Express	Do.	July 8th.
Sun	Do.	July 6th.
Deeming's Honey-comb	Potteries	Sept. 5th.
Pickford's Vans	London	May 2d.
Pickford's Wag-gons	Sheffield	April 3d.
Lord Nelson	Nottingham	Nov. 15th.
Samuel Eyre	Stockport	Sept. 10th.
Ralph Harper	Do.	April 4th.
Agnes Cornthwaite	Do.	Sept. 14th.
Jas. Ramsbottom	Do.	Dec. 21st.

“Extra Coaches on the road, Ellis Bramall of Stockport, Birmingham Express, 3 horses.”

“There was a Birmingham Coach called the Giraffe that has ceased running, but there is an extra 3 horse coach on the road called the Brilliant which runs into the Potteries.”

The total loss to the lessees of the tolls named appears to have been £1201:7s. in the year ending August 24, 1837.

able, and result in the works proving unremunerative to the constructors. Scientific men of eminence were not wanting to give countenance to those fears, as we find that the opinion that tunnels could not be properly ventilated was one that found favour with men of as much scientific knowledge as Dr. Lardner, who, however, lived to chronicle the reverse of all he had feared.

Amongst the other incidents of the opposition to railways is recorded the fact, that when the Edinburgh and Glasgow Railway was projected, it was successfully opposed on frivolous pretences, one of them being, that the locomotive engines, in passing through the Princes Street Gardens, in the centre of Edinburgh, would throw out sparks and blow up the powder magazine on the Castle,—the magazine being a bomb-proof building three hundred feet above the level of the railway proposed to be made, and which was subsequently constructed without any such appalling results ensuing.

OPPOSITION IN THE PRESS.

Only four years previous to the laudatory sentences quoted in a former page, the *Quarterly Review* asked the question :—“What can be more palpably absurd and ridiculous than the prospect held out of locomotives travelling twice as fast as stage coaches? We trust that Parliament will, in all railways it may sanction, limit the speed to eight or nine miles an

hour, which, we quite agree with Mr. Sylvester, is as great as can be ventured on with safety."

In another place the same Review said:—"As to those persons who speculate on making railways general throughout the kingdom, and superseding all the canals, all the waggons, mail and stage coaches, post-chaises, and, in short, every other mode of conveyance by land and by water, we deem them and their visionary schemes unworthy of notice. The gross exaggerations of the powers of the locomotive steam-engine, or, to speak in plain English, the *steam-carriage*, may delude for a time, but must end in the mortification of those concerned." How ridiculous this reads now to us, who see how completely the results are at variance with the confident predictions! and equally ridiculous will our ignorance and prejudice appear to those who come after us.

The example thus set in the highest places of literature of course found many imitators in the lesser press; but it would be wearisome to give more than a few examples of the kind of writing which was to be found in many newspapers of the date.

"What person," asked the *Tyne Mercury*, on November 18, 1824, "would ever think of paying anything to be conveyed from Hexham to Newcastle, in something like a coal waggon, upon a dreary waggon-way, and to be dragged for the greater part of the distance BY A ROARING STEAM-ENGINE?"

"There has been some talk,"

wrote the *Whitehaven Gazette*, "from a puff criticism in the *Monthly Review*, of an improvement on the principle of railways, but we suspect this improvement will turn out like the steam carriages, that were to supersede the use of horses entirely, and travel at a speed almost equal to the speed of the fleetest horse."

An "able editor" of 1831 states his conviction that not one of the classes accustomed to move about would take to the rail. "Commercial travellers who stop and do business in all the towns, and by so doing render commerce much easier than it would otherwise be, and who give that constant support to the houses of entertainment which makes them able to supply the occasional traveller well and at a cheap rate, would, as a matter of course, never by any chance go by the railroad; and the occasional traveller, who went by the same route for pleasure, would go by the coach-road also, because of the cheerful company and comfortable dinner. Not one of the nobility, the gentry, or those who travel in their own carriages would by any chance go by the railway. A nobleman would certainly not like to be drawn at the tail of a train of waggons, in which some hundreds of bars of iron were jingling with a noise that would drown all the bells of the district, and in the momentary apprehension of having his vehicle broke to pieces and himself killed or crippled by the collision of these thirty-ton masses. The causes of greatest danger on

the railway are several. A velocity of *fifteen miles an hour* is in itself a great source of danger, as the smallest obstacles might produce the most serious consequences. If at that rate, the engine or any forward part of the train, should suddenly stop, the whole would be cracked by the collision like nut-shells. At all turnings there is a danger that the latter part of the train may swing off the rails, and, if that takes place, the most serious consequences must ensue before the whole train can be stopped. The line, too, upon which the train must be steered admits of little lateral deviation, while a stage-coach has a choice of the whole roadway. And independently of the velocity, which in coaches is the chief source of danger, there are many perils on the railways: the rails stand up like so many thick knives, and anyone alighting on them would have but a small chance of his life. On a road crowded with engines, to escape from the rails would avail him but little, as before he could recover himself from a slight stunning, a train on the same rails would be up, and before the conductor could arrest the progress of that one he would be cut asunder." And so on ! and so on !!

In his *Treatise on Railroads*, published in 1825, Mr. Nicholas Wood, commenting on Mr. Charles Maclaren's articles published the year before, and which are referred to on a subsequent page, said :—

"It is far from my wish to promulgate to the world that the

ridiculous expectations, or rather the *professions*, of the enthusiastic speculatists will be realised, and that we shall see engines travelling at the rate of twelve, sixteen, eighteen, or twenty miles *an* hour. Nothing could do more harm towards their adoption or general improvement than the promulgation of such *nonsense* !"

OPPOSITION FROM CANAL PROPRIETORS.

Interested opposition from the owners of canal property was to be expected, and this was unsparingly used. A pamphlet was most industriously circulated throughout England, with the view of setting forth the great superiority of canals over railways, and also of showing what a ruinous speculation the Liverpool and Manchester Railway had been. Such assertions, however, met with a speedy refutation ; and, in some discussion which arose on the subject, the author of the pamphlet let out that he had been hired on purpose, and also, what is curious, that his reward was not simply derived from proprietors of coaches and canals, but that one of our great seminaries of religion and learning had liberally afforded him its share of support.

This pamphlet of course failed in its effect, but shortly after the Liverpool and Manchester line was opened another Canal Company took up the argument where it had been dropped, and pleaded that their case was different from

the canals in opposition to which that line had been constructed. It was ingeniously argued by the directors of the Union Canal between Edinburgh and Glasgow, that although the projectors of the Edinburgh and Glasgow Railway supposed that if a railway were formed between Edinburgh and Glasgow, they would withdraw the road passengers from the coaches by a reduction of charges and saving of time; yet it must be observed that this was by no means so certain as in the case of Liverpool and Manchester. "There the distance by the railway is seven miles shorter than by the turnpike road, and the total rise in the way of carriages, does not much exceed one hundred feet in twenty-nine miles, which is the length of the railway independent of the tunnel to the docks, which is not entered or traversed by the railway coaches. No railway can be found nearly so short as the turnpike road between Edinburgh and Glasgow without a rise in the way of carriages of 600 feet; and this rise is so distributed that to surmount it there must be at least three or four inclined planes, up which the carriages must be drawn by the aid of fixed steam-engines. The delay and danger consequent on this rise will be such as to give the coaches very great advantages in a contest with the railway company."

The view so ingeniously pleaded by the canal company found an echo five years later in a German visitor to Britain, Herr F. von Raumer,

who, in his *Letters from England*, in 1835, says:—"I of course went on the iron railroad from Liverpool to Manchester. In spite of all that one may have heard or read on the subject, it makes a peculiar impression to see this long row of waggons, loaded with so many passengers and goods, hasten along with unparalleled velocity, merely by the agency of a little fire and water. It is commendable that Germany desires to participate in the wonderfully far-increased facilities of intercourse. But let us take care not to throw away large sums if unfavourable circumstances should prevail. There is a noble enthusiasm which will not remain below what is attainable; but there is also a vaingloriousness which vaunts of impossibilities, and treats practicable and useful enterprises with very unjust disdain. The construction of the iron railroad from Liverpool to Manchester, which is thirty English miles in length, cost above five and a half millions of dollars. Such a capital cannot yield sufficient interest, except where two very large cities lie at a short distance from each other, of which one imports and the other exports an immense quantity of goods. Such a state of things is scarcely to be met with a second time in the world. No rocks can be blasted, and no valleys raised, for the sake of a few individuals who would like to travel more rapidly for their pleasure. Nothing but an extraordinary traffic makes such an enterprise practicable and useful."

"It was long," says a writer in *St. Paul's Magazine*, "before railways began to be understood and appreciated. The invention had for years been made known, yet it remained dormant and useless ; and, when the project was fully started, how incredulous every one was ; what prejudices, what obstructions, what opposition, had to be met with and overcome ! Would it be practicable, or useful, or safe, to travel at such a speed ? And how much mischief was apprehended to arise from railways ! What damages to the householders adjoining the lines ! Horses would no longer be of any use. Oats and hay would prove unsaleable commodities. Country inns would be ruined. The boilers would burst, and passengers would be blown to atoms. Happily the unfounded apprehensions of the ignorant were laughed at and unheeded."

Even distinguished authorities, who had looked into all the various modes of conveyance, hesitated to acknowledge the superiority of railways. Thus, Sir Henry Parnell observes, in his *Treatise on Roads*, that "where the trade is altogether a *descending* one, and water scarce, they are preferable to canals, and may be constructed cheaper ; but, for general traffic over a wide extent of country, they do not afford as cheap a means of conveyance as canals." "Time is money" had not as yet been fully understood as applied to railways ! This same writer is seen to have had little faith in locomotive railways, for he states that "it has

been well ascertained that railroads on which horses are employed are always found in much better order and repair than those on which locomotive engines are used." The truth of this, even in 1831, may be doubted.

EARLY OPINION IN FAVOUR OF RAILWAYS.

Amongst the public bodies who were able to foresee at an early date the possible advantages of railways, the Highland and Agricultural Society of Scotland takes an honourable place. It can perhaps hardly be claimed for the society that its directors foresaw all that might be made of a system which was, at the time referred to, actually in its infancy. But there is a tolerably clear perception of some of the possible uses of railways in their letters to the ironmasters of Scotland, in 1818, in which the following remarks, for example, occur :—

"It seems to be desirable that railways, for alternate carriage and general use, should proceed on a continued level, or upon successive levels, and a simple system of *lockage* (if it may be so called) by which loaded waggons may easily be elevated or depressed from one level to another, would appear to be a desirable attainment. The edge railway is generally used and preferred in Scotland as causing less friction and less expense of horse-power ; and it would tend to facilitate the general use of railways, if, by

some simple change, the wheel usually employed for the road or street could be made also to suit the railway, or the railway wheel also made to suit the road or street, so that the cart or waggon which brings the commodity from the colliery or stone quarry, the farm-yard or the manufactory, to the railway, might travel along it to the termination of the railway, and proceed from thence through the streets of the town to the house of the consumer without unloading or change of carriage."

At the same time, the Highland Society offered a premium for the extension of railways in the following terms:—

"Improvement and Extension of Iron Railways. A piece of plate of fifty guineas value for the best and approved essay on the construction of railroads for the conveyance of ordinary commodities. In this essay it will be essential to keep in view how far railroads can be adapted for common use in a country, the means of laden carriages surmounting the elevations occurring in their course, and whether railroads or the wheels of carriages may be so constructed as to be applicable to ordinary roads, as well as to railroads, so that no inconvenience shall be experienced on leaving either to travel on the other—the essay to be accompanied with such models or drawings as shall be sufficient to illustrate the statements it contains."

The following Queries were issued with this offer:—

1. What is the best breadth of railway, and the best form of a waggon or carriage, for the conveyance of commodities in general?

2. Supposing the trade alternate, it will be desirable that the railway should proceed on a continued level, or upon successive levels. What are deemed the best means, with reference to economy and despatch for elevating or depressing the laden carriages from one level to another.

3. Supposing the edge railway, which is generally preferred in Scotland, to be adopted, can a wheel be so constructed as to be applicable to streets and ordinary roads, as well as railroads, so that no inconvenience shall be experienced on leaving either to travel on the other.

CHARLES MACLAREN ON RAILWAYS.

Far more interesting than the action of the Scotch society were the articles in support of railway extension which were written in 1825 by Mr. Charles Maclaren, editor of the *Scotsman*. In an earlier chapter we have seen that a successor of Mr. Maclaren in this editorial chair was almost alone amongst British journalists in advocating the great scheme of M. de Lesseps for the formation of the Suez Canal, and it is not a little creditable to Scottish journalism that this should have been the second time within one genera-

tion that successive editors of the same newspaper should, in the midst of indifference or adverse opinion, have advanced views which, although ridiculed at the time, afterwards became of universal acceptance. In 1829 the editor of the *Mechanics' Magazine*, in referring to the locomotive competition in which the 'Rocket' was victorious, says "The *Scotsman* had the honour, four years ago, of first bringing forcibly under public notice the advantages derivable from locomotive carriages on railways;" and twenty-two years later the *Economist* said of Mr. Maclaren's articles that "they prepared the way for the success of railway projectors." By their extensive circulation in Britain and America, as well as on the continent of Europe—where they were republished in French and German—the articles did much to press forward the great travelling reform of the century. Not only did Mr. Maclaren anticipate the achievements of railways in the matter of speed, but he foreshadowed their general utility and the effect they would produce on society. Considerations of space will not permit that we should here reproduce all the arguments and calculations of those remarkable articles, but their interest is so great that a few of the more interesting portions may be given. Commencing at the beginning of his subject, Mr. Maclaren gives the following sketch of travelling and transport up to his time:—

"There is no single circumstance so essential to the improvement of

a country as abundant and easy means of internal communication. Part of the price of commodities always consists of the expense of bringing them from the place where they are made or raised to the market. Where canals and well-made roads abound, and vehicles are skilfully constructed, this amounts, in general, only to a small percentage upon the first cost; but in rude and backward districts, unprovided with tolerable roads, it often enhances the cost of the article to three or four, or even ten times the original amount, and of course either greatly lessens or entirely precludes their use. Coal, for instance, is not found within less than a hundred miles of London; and had some more economical mode of conveyance than carting not been found out, this article, which is sold at 40s. a ton in the metropolis, would have cost six pounds—a price which would have been nearly equivalent to a prohibition against the use of this species of fuel. Such are the vast facilities which navigation affords for the transportation of commodities, that the coal of Gloucestershire can be sent by sea at a cheaper rate to Jamaica than it could be sent by land in carts to London.

"In early times the roads were mere foot-tracks, and goods were universally carried on the backs of horses. To these succeeded gravelled roads for wheeled carriages, and the latter were followed by canals. A horse put into a wheeled carriage will draw,

upon a well-made road, as much as four horses would carry on their backs; but when employed in tracking a boat on a canal, he will perform as much work as thirty horses in carts, or as a hundred and twenty pack-horses.

"Railways are a much more recent invention than canals; and for particular purposes, such as the conveyance of coal, stone, or other heavy commodities, down a short inclined plane, sloping at an angle of three or four degrees, they are decidedly superior. As a means of general communication they are cheaper in the first outlay than canals, more commodious in some respects, and adapted to a greater variety of situations; but so long as horse-power was the only power employed, it may be doubted whether the balance of advantage was not in favour of canals. We are quite satisfied, however, that the introduction of the locomotive steam-power has given a decided superiority to railways. Indeed we are convinced, and we hope by and by to convey some share of the conviction to the minds of our readers, that the general use of railways and steam-carriages, for all kinds of internal communication, opens up prospects of almost boundless improvement, and is destined, perhaps, to work a greater change on the state of civil society than even the grand discovery of navigation.

"The value of the railway, as a medium of commercial communication, has not escaped the sagacity of Dr. Young. In his *Lectures*

on Natural Philosophy he says:—"It is possible that roads paved with iron may hereafter be employed for the purpose of expeditious travelling, since there is scarcely any resistance to be overcome except that of the air; and such roads will allow the velocity to be increased almost without limit."

After describing several forms of rail already in use, the writer proceeds to illustrate his position by the following remarks:—"The waggons generally used run upon four wheels, of from two to three feet diameter, and carry from 20 to 50 cwt. Four or five of them are drawn by one horse. On the dead level railway, constructed by Mr. John Grieve for Sir John Hope, near Musselburgh, which is one of the most perfect in Britain, a single horse draws five loaded waggons, each containing 30 cwt. of coals, at the rate of four miles an hour—in all seven tons and a half, exclusive of the waggons, which weigh three tons more. Reducing the velocity to two miles an hour, by Professor Leslie's rule, the horse should draw 12 tons, or 15 including the waggons." On the question of relative cost he gives some interesting figures:—"The breadth of ground required for a single railway is from nine to twelve feet; for a double one, from nineteen to twenty-five. The expense of a double road, including the price of the ground, may be estimated generally at from £3000 to £5000 per mile, or from *one-half* to *one-third* of the expense of a canal. Mr.

Stevenson says:—‘The first expense of a canal will be found to be double, if not treble, the expense of a railway; such are the difficulties of passing through a well-cultivated country, and especially of procuring a sufficient supply of water in manufacturing districts, that four times the expense will in most cases be nearer the mark.’ We speak here of railways of the ordinary kind for the transportation of goods; but it is probable that one destined to serve the purpose of a great national thoroughfare, for vehicles of all kinds, quick and slow, would cost at least twice as much. Even in this case, however, the original outlay would certainly not amount to more than a half or a third of what would be required for a canal of such a magnitude as to afford the same amount of commercial accommodation.”

In a subsequent article Mr. Maclaren gave some exceedingly interesting calculations as to friction and resistance of the air, going into the subject with great minuteness:—“The resistance to the motion of a vessel in the sea or a canal is of an extremely different kind from that which a carriage of any kind experiences upon a common road or a railway. In the former case it arises from the pressure of the water on the bow and sides of the vessel; in the latter, from the friction of the axle in its box, and that of the rim of the wheel on the gravel or iron rail. On a well-made road a horse will draw a load of 1 ton, in a

cart weighing 7 cwt., at the rate of two miles an hour. The whole strength of the horse is exerted in overcoming the friction. On such a road, therefore, a force of traction of 100 pounds moves a weight of 3000 pounds, or the friction is 1-30th part of the load (the cart included).

“On a railway of the best construction a horse, travelling at the same rate of two miles an hour, draws 15 tons, including the vehicles. In this case, then, a power of traction of 100 pounds moves a weight of 33,600 pounds; the friction, of course, is 1-336th part, or, in round numbers, 1-300th part of the load.

“On a canal, a horse travelling at two miles an hour draws 30 tons in a boat weighing probably 15 tons. Reducing the ton to 2000 pounds, for the sake of round numbers, as in the last calculation, we find here that a power of traction of 100 pounds moves a mass of 90,000 pounds, or the resistance which the water opposes to the motion of the vessel is equal to 1-900th part of the load or entire weight.

“We see, then, that the effect produced by the draught of a single horse is ten times as great upon a railway, and thirty times as great upon a canal, as upon a well-made road. Yet a railway costs only about three times as much as a good turnpike road, and a canal about nine or ten times; and the expense of keeping the railway and canal in repair is probably less in proportion to the original

outlay than in the case of a road. It is obvious, then, that were railways to come into general use, two-thirds or more of the expense of transporting commodities would be saved. With regard to the comparative advantages of canals and railways, so far as the present facts go, we may observe, that if a horse-power effects three times as much upon a canal as upon a railway, the canal costs about three times as much, and will of course require nearly the same rates or *dues* per ton to make the capital yield the same interest."

Without following out Mr. Maclaren's ingenious calculations, we may give his conclusion, that "*the very same amount of constant force which impels a car on a railway at two miles an hour would impel it at ten or twenty miles an hour if an extra force were employed at first to overcome the inertia of the car, and generate the required velocity.* Startling as this proposition may appear, it is an indisputable and necessary consequence of the laws of friction. In fact, assuming that the resistance of the air were withdrawn, if we suppose a horizontal railway made round the globe, and the machine (supplied with a power exactly equivalent to the friction) to be placed on the railway, and launched by an impulse with any determinate velocity, it would revolve for ever with the velocity so imparted, and be in truth a sort of secondary planet to our globe.

"Now, it would be at all times easy (as we shall afterwards show)

to convert this accelerated motion into a uniform motion of any determinate velocity; and, from the nature of the resistance, a high velocity would cost almost as little, and be as easily obtained, as a low one. For all velocities, therefore, above four or five miles an hour, railways would afford facilities for communication prodigiously superior to canals or arms of the sea. Indeed, there is scarcely any limit to the rapidity of movement these iron pathways will enable us to command."

Of this conclusion (which was in the existing state of experience a daring one) Mr. Maclaren said in another article:—

"We are afraid that some practical men will be disposed to treat these propositions as matter of idle and fruitless speculation. We confess this does not at all abate our confidence in their truth. We know that no useful improvement has ever been introduced without a hard struggle with their ignorance and prejudices, which create a species of moral resistance more intractable than the *vis inertiae* of matter to the mechanician.

"The most sanguine speculation, in our opinion, is often less offensive and less wrong-headed than your thorough-paced practical man, who is generally an incorrigible dogmatic as to the nostrums, right or wrong, which his own narrow experience has taught him, and stubbornly incredulous as to everything beyond them. We believe, however, it will not be

difficult to reconcile the principle we have been laying down with the results of every day's experience, as some may suppose ;" and he proceeds with demonstration and illustration to make good his points :—

"Everybody knows that the rate of stage-coach travelling in this country has increased within the last twenty-five years, and this too before the roads were macadamised, and with much less injury to the horses than was anticipated. Supposing that a coach-horse could run fourteen miles, unloaded, with the same muscular exertion which carries forward the stage-coach at eight or nine miles, then Professor Leslie's formula becomes $\frac{3}{4}(14-v)^2$. Each horse would, of course, draw with a force of 48 pounds at six miles, and of 27 pounds at eight miles an hour. But if the friction increased in the ratio of the velocity, the load upon each horse would increase from 48 to 60 pounds when the speed increased from six to eight miles an hour ; and as the horse, exerting the same strength, would only pull with a force of 27 pounds, he would thus have more than double work to do, which is plainly impossible. But admit that the friction is equal in equal times, then, since the time is diminished one-fourth by increasing the speed from six to eight miles an hour, the horses have actually one-fourth less to do ; the load upon each is reduced from 48 pounds to 36. The fact, we believe, will be found strictly consistent with this hypothesis,

and decidedly at variance with the other. However strange then it may sound to common observers, it is practically true, that a smaller absolute amount of force will drag a coach over the same space in three hours than in four, and in one hour than in two.

"Common roads, however, vary so much in the nature of their surface and their inclination, that the results they afford cannot easily be subjected to the calculations of the mathematician. With railways the case is otherwise."

Here the writer proceeds to work out his argument, and then goes into the question of the resistance of the air. On this subject he says :—

"During high winds this resistance is so considerable, that means should be taken to lessen its amount ; first, by making the vehicle long and narrow, rather than broad and short ; and, secondly, by giving the front a round or hemispherical form. Let us suppose, then, that there are two steam vehicles, each weighing, with its engine, fuel, and load, 15 tons. The one a steam-waggon for conveying goods, is 6 feet high and 5 feet wide, and has, of course, a front of 30 square feet, which, in reference to the pressure of the air, is reduced to 15, by giving it a rounded form ; the other a steam-coach for carrying passengers, is 8 feet high and 8 wide, or 7 high and 9 wide, presenting a front of 60 square feet, but reduced to 30 by its rounded form. . . . The steam-waggon, pre-

senting only half the surface in front, would experience only half the resistance."

The argument is continued to show the superiority of railways over canals, as regards resistance, and Mr. Maclaren proceeds to state that "nearly three times as much power would be required to move an equal mass at 6 miles an hour on a canal as on a railway; 5 times as much power would be required at 8 miles an hour, 10 times as much at 12 miles, 15 times as much at 16 miles, and 21 times as much at 20 miles an hour. It is evident also, that an addition of power too trifling to add anything material to the weight of the vehicle, would raise the terminal or uniform velocity from 4 miles an hour to 20; and that, speaking practically, it would cost no more to command a velocity of 20 miles an hour on the railway than a velocity of one. Except for the chances of injury, to the railway or the vehicle, there would not be the smallest reason for conveying goods, even of the coarsest kinds, at 4 miles, rather than at 20 miles an hour!"

The conclusion of those highly ingenious and interesting speculations is as follows:—"The atmosphere equally opposes the progress of the stage-coach, the track-boat, and the steam-boat; but the motion of these vehicles is comparatively so slow, and the power of impulsion required to overcome the other impediments to their progress is so great, that the resistance of the air is disregarded."

"In discussing this subject so much in detail, we have perhaps exceeded what is suitable to our limits; but it is singular that, so far as we know, the application of the laws of friction to the motion of carriages on railways has scarcely ever been investigated. Yet the subject is of vast importance, and the results extraordinary. Among all the new projects and inventions with which this age teems, there certainly is not one which opens up such a boundless prospect of improvement as the general introduction of railways for the purpose of commercial communication. We have spoken of vehicles travelling at 20 miles an hour; but we see no reason for thinking that, in the progress of improvement, a much higher velocity may not be found practicable. Tiberius travelled 200 miles in two days, and this was reckoned an extraordinary effort; but in our times, a shopkeeper or mechanic, on the most ordinary occasion, travels twice as fast as the Roman Emperor; and twenty years hence, he may probably travel with a speed that would leave the fleetest courser behind. Such a new power of locomotion cannot be introduced without effecting a vast change in the state of society. With so great a facility and celerity of communication, the provincial towns of an extensive empire would become so many suburbs of the metropolis; or rather the effect would be similar to that of collecting the whole inhabitants of a country

into one city. Commodities, inventions, discoveries, opinions, feelings, would circulate with a rapidity hitherto unknown; and, above all, the personal intercourse of man with man, nation with nation, province with province, would be prodigiously increased."

REALISATION OF MR. MACLAREN'S SPECULATIONS.

When the trial of the Liverpool and Manchester engines took place in 1829, as already described, Mr. Maclaren reverted to the subject in the columns of the *Scotsman*. His first feeling appeared to be one of surprise that the subject had excited so little attention in the London press, public attention not being really called to the matter till the following year, when the opening of the railway and Mr. Huskisson's death combined to force the progress of the locomotive into notice. On this indifference Mr. Maclaren observes:—

"It is melancholy to observe how rarely objects, events, or individuals are estimated according to their true importance. All the periodical pens in London at this moment are at work upon the Turkish Treaty, the New Police, Cobbett's Corn, Mr. Lister's tragedy, the Newark Meeting, and, perhaps, one or two most bloody and barbarous murders. We have columns and pages filled day after day with comments on these matters, which two months hence will be completely superseded with some-

thing equally ephemeral; while we have not seen in one of the metropolitan prints a single remark on the experiments at Liverpool, which unveil mechanical truths of such stupendous importance, that if objects are to be judged of by their influence on the condition of man, the Russian campaigns, the Catholic question—nay, though some may stare, we will add, the French Revolution, sink into nothing in the comparison. How trifling was the effect produced by all the wars of the fifteenth century on the state of the world compared with the discovery of printing! And how little were the consequences of that discovery understood by the contemporaries of Faust and Gutenberg? The experiments at Liverpool have established principles which will give a greater impulse to civilisation than it has ever received since the Press first opened the gates of knowledge to the human species at large. . . . Even steam navigation gives but a faint idea of the wondrous powers which this new agent has put into our hands. It is no exaggeration to say that the introduction of steam carriages on railways places us on the verge of a new era—of a social revolution of which imagination cannot picture the ultimate effects. . . . Twenty years ago we believe the mails did not travel faster than seven miles an hour. From seven miles it was raised to eight, and every one cried out what an improvement! From eight it was

raised to nine, and this was hailed as nothing less than 'prodigious!' Attempts are now making to force it up to ten miles an hour, but at anything beyond this to a certainty horse-power fails us. How then shall we find terms adequate to express the value of a discovery which lifts us at once from nine miles to twenty or twenty-four miles an hour, which carries us as far beyond the speed of the mail as the mail is beyond that of a brewer's dray or a carrier's waggon?"

And as regards his own speculations in 1824 he speaks with becoming pride of their realisation, and remarks:—"There did not exist at that time a scrap in any scientific work on the subject, except the old papers of Vince and Coulomb, which merely referred to friction with very low degrees of velocity. From very scanty data, we investigated the motion of carriages on railways, and arrived at conclusions which excited no small surprise. *Practical* men, as they term themselves, were shocked. We were called dreamers, enthusiasts, and visionaries, for supposing that so heavy a machine as a locomotive engine could draw carriages at the rate of twenty miles an hour, or that men would risk their persons in vehicles moving with such a velocity. The trial has been made, however, and the result has confirmed and even exceeded our most sanguine expectations. The engineers who were present at the experiments now talk familiarly of *thirty miles*

an hour as a practicable thing, with deductions merely of the time lost in taking in new supplies of water and fuel. In some theoretical points we may have erred, for we travelled in an untrodden path; but when due allowance is made for the imperfect data we had to proceed upon, we think our calculations in all essential points come wonderfully near to the truth as evolved by the recent experiments."

FAVOURABLE IMPRESSIONS OF THE RAILWAY.

A generation which has been accustomed from its earliest years to express trains, and other everyday marvels of the railway system as we now know it, can hardly appreciate the surprise, the admiration, and it might almost be said the childlike wonder, which the first locomotive trains excited in the breasts of those who travelled with them. A few quotations from current publications will illustrate this:—

"If only ten years back," says a writer in the *Penny Magazine* in 1833, "it had been said that persons could pass, without inconvenience and without danger, over a distance of thirty-one miles in one hour, the tale would have been treated as one of those visionary stories which in former days were the amusements of the nursery." Working out a similar idea to this, though carrying the visionary story much farther back than one year before Mr. Maclaren's

demonstration of the probability that such a speed might be attained, a writer in Douglas Jerrold's *Shilling Magazine* produced in the following decade a delightfully written "Fairy Tale for a Hundred Years ago," in which the marvels of the Thames Tunnel, the Steamboat, the Electric Telegraph, and the Locomotive, formed the subject of the spell which the Prince of the story had to work out before he could win the Princess Cherrylips:—

Breathe under the keel of a ship that
sails,
Urge her ahead 'spite of winds and gales,
Draw whispered words from dumb iron
wire,
Feed a fleet steed with coals of fire!

At the time we now refer to, the second and fourth part of the task had been completed, and the marvels of the locomotive almost excited as much wonder amongst the people as in the Fairy Tale the steed fed with coals of fire did in the breast of Prince Jocund.

Turning to more sober views of the wonderful steam-horse, a few quotations from current writers may be given, and as Mr. Maclaren was first in foreseeing what might probably result, so we may put him first in chronicling the realisation of his speculations. Writing of the locomotive trial in 1829, the *Scotsman* remarked:—

"The extraordinary speed of this conveyance is only one of its advantages. A friend of ours who was present at all the experiments, and in the waggon when going at thirty-two miles an hour, assures

us that the motion is so remarkably smooth and easy that if you fix your eyes on the inside of the machine, or on any distant object, you cannot believe you are travelling faster than in an ordinary stage coach; and it is only when you look at the hedges, trees, or houses close to the road, and see them vanishing like meteors, that you get an idea of the tremendous velocity of your movement. Were the vehicle nicely poised on springs, and covered in to exclude the external current of air created by its motion, you might imagine that you were in a state of perfect rest while you are flying along the surface with the speed of a racer. . . . In daylight, and with good arrangements, travelling in the steam-coach at twenty miles an hour may be much more safe, as well as pleasant, than in an ordinary stage coach at eight or nine." . . .

"Sixty or seventy years ago the journey from Edinburgh to London occupied twenty days; at present, taking the average of all the modes of conveyance by land and water, it occupies three or four, and the quantity of travelling has increased probably twenty or thirty fold. Are we too sanguine in anticipating another increase equally great, when the time is reduced from three or four days to twenty hours, the expense almost in the same proportion, and when the traveller is put in possession of a much higher degree of ease and comfort? Let the improvement we speak of be realised, let what was once a

journey of twenty days be reduced to one of as many hours, and we have not a doubt that we shall have five hundred times as much travelling as we had in the year 1760. In point of fact, when the time is reduced from eighty hours to twenty, the result is exactly the same as if Edinburgh were brought as near to London as Leicester or Birmingham; and, to pursue the comparison, when the journey was one of twenty days, the effect was the same as if Edinburgh had stood in Iceland. Besides, we must always remember that the intercourse grows in a much greater ratio than the distance is shortened. Volumes might be written without exhausting the materials for speculation arising out of such a change."

The editor of the *Leeds Mercury*, speaking of the same experiment, says: "We had the pleasure to travel on a level at the rate of twenty-eight miles an hour, with as little appearance of danger, and even of undue speed, as is felt in a stage coach travelling on the highway at the ordinary speed. The motion, indeed, of the carriage was so slight, that the passengers could read with perfect ease at the period of its utmost velocity, and if the springs on which the carriage was mounted had been in perfect order, we think it would not have been very difficult to write."

And from the *Penny Magazine*, already quoted, we extract a glowing picture of the actual attainments in the daily trips on the

railway, and a forecast—not yet, however, realised,—of the promotion of peace and concord by the new method of communication:—

"A 'trip,' as it is called, by this extraordinary road for the first time, is an event which cannot readily be effaced by the recollections of more common modes of travelling. A pleasurable wonder takes possession of the mind as we glide along at a speed equal to the gallop of the race-horse. It might be supposed that so great a speed would almost deprive the traveller of breath, and that he could not fail to be unpleasantly conscious of the velocity with which he cut through the air. The reverse is, however, the case; the motion is so uniform and so entirely free from the shaking occasioned by the inequality or friction of common roads, that the passenger can scarcely credit he is really passing over the ground at such a rapid pace, and it is only when meeting another train, and passing it with instantaneous flight, that he is fully aware of the velocity of his career. The novelty of the scene is delightful; now, where the natural surface of the ground is at the highest, we travel embosomed in deep recesses, and then, where the ordinary course of the road would lead through a valley, we 'ride above the tops of the trees,' and look down upon the surrounding country. The reflecting traveller probably falls into a pleasing vision, arising out of the triumph of human art. He sees the period fast approaching when the remotest

parts of his own country shall be brought into easy and rapid communication ; and he looks beyond this probable event of a few years, to the more distant day when other nations shall emulate these gigantic works of peace. He sees the evils arising out of difference of language, and soil, and climate, all vanishing before the desire of mankind for peaceful commercial intercourse ; and as he knows that the prejudices and mistaken interests which separate one district of the same nation from another are broken down by such noble inventions as these, he feels that the same spirit of civilisation which results from that exercise of our reason which is bestowed by a beneficent Providence, will eventually render all men as brethren, and children of one great Father." "The natural effect of commerce," as we have already quoted from Montesquieu, "is to tend to and consolidate peace."

GROWTH IN PUBLIC FAVOUR.

The growth of public opinion in favour of railways was not very rapid, despite the considerable success which the opening of "the Stockton and Darlington, the Liverpool and Manchester, had demonstrated. It was possible, however, for Mr. Martin, in writing on one of our Scotch railways—the Glasgow and Garnkirk—in 1835, to speak in the following strain:—"Notwithstanding the visionary objections of certain theorists, and the prejudices of a few individuals

denominating themselves practical men, railways are gradually securing for themselves the approbation and support of the enlightened portion of the community." And a Letter to the Shareholders of the London and Southampton Railway in 1836, spoke hopefully of the inducements to travel which the yet infant system presented:—"The facility which railroads offer for removing from one place to another, the speed with which space is overcome, will induce many persons to travel to parts which have hitherto been considered as out of reach, and as impracticable on the score of distance." About this time, in the report of Robert Stevenson and Son, on the advantages of a deep-water harbour at Granton (as compared with Leith), the plan shows a railway to join the *Union Canal* on a line much the same as that taken about thirty-five years later by the Granton branch of the Caledonian Railway,—the earlier ideas in regard to railways being, that they should be *accessory* to the canal system, and not wholly in substitution for it, as they have proved to be ; and that the full purpose and meaning of railways had not been realised even a year or two later, is shown by Dr. M'Culloch's remarks, that, "So far as we can at present judge, railroads seem to be, in all cases, better suited for the conveyance of passengers than of goods." In other pages of his *British Empire*, Dr. M'Culloch remarks that it was "essential to the success

of railways that they should be level, or as nearly so as possible." He was, however, so far sensible of the value of railway transit as to say that while he believed the advantages likely to be derived from the extension of the system to other parts of the country to have been a good deal exaggerated, yet, "after every reasonable deduction has been made from the too sanguine anticipations of the projectors of railroad schemes, there can be no doubt that a new era has commenced in travelling, and that wherever the ground will admit, all considerable towns not very remote from each other, or which have an extensive intercourse, will be connected by railways."

In a speech at Glasgow in January 1837, Sir Robert Peel spoke of the advantages the railway system had even then conferred on the world:—"The steam engine and the railway are not merely facilitating the transport of merchandise; they are not merely shortening the duration of journeys, or administering to the supply of physical wants; they are creating new demands for knowledge; they are fertilising the intellectual as well as the material waste; they are removing the impediments which obscurity or remoteness or poverty may have opposed to the emerging of real merit. They are supplying you, in the mere facility of locomotion, with a new motive for classical study; they are enabling you to enjoy the intoxicating

draught which is described with such noble enthusiasm by Gibbon: 'At the distance of twenty-five years I can neither forget nor express the strong emotions which agitated my mind as I first approached and entered the Eternal City. After a sleepless night, I strode with a lofty step the ruins of the Forum; each memorable spot, where Romulus stood, or Tully spoke, or Cæsar fell, was at once present to my eye; several days of intoxication were lost or enjoyed, before I could descend to a cool or minute investigation.'" It must be admitted that Sir Robert, in dragging in Gibbon to illustrate the advantages of railways in the matter of continental travel, was cutting somewhat before the point. The first railway in Italy was not made till ten or twelve years after he spoke, and Rome was not thus approachable till much later still.

One of the most decided opinions amongst those who at an early date favoured the railway system was that of Dr. Arnold of Rugby, who said:—

"I rejoice to see it and to think that feudality is gone for ever. It is so great a blessing to think that any one evil is really extinct."

And an even more illustrious advocate for their use, and that in a practical way, was found in the case of Queen Victoria, who began to travel by rail in 1842, and thus set an example to the nobility, among whom there was at first a disposition to maintain

the habit of travelling by their private carriages and post-horses. The railway, and this example together, proved too much for the exclusives.

"Railroad travelling," says the Rev. Sydney Smith, "is a delightful improvement of human life. Man is become a bird; he can fly longer and quicker than a solan goose. The mamma rushes sixty miles in two hours to the aching finger of her conjugating and declining grammar boy. The early Scotchman scratches himself in the morning mists of the north, and has his porridge in Piccadilly before the setting sun. The Puseyite priest, after a rush of a hundred miles, appears with his little volume of nonsense at the breakfast of his bookseller. Everything is near, everything is immediate; time, distance, and delay are abolished."

As is well known Sydney Smith had an *arrière pensée* when he wrote those words, his intention being to protest against the system of "locking in," which had given rise to some incidents of horror in an accident on the Orleans Railway, the second railway in France. On this question of "locking in" Sydney Smith waxed very indignant. It was not the actual danger of locking in he objected to so much as the interference with personal liberty it implied and the evil effects on the imagination. "It is not only the locking of the doors which is to be deprecated, but the effects which it has on the imagination. Women,

old people, and the sick, are all forced to travel by the railroad; and for 200 miles they live under the recollection not only of impending danger, but under the knowledge that escape is impossible—a journey comes to be contemplated with horror. Men cannot persuade the females of their family to travel by the railroad; it is inseparably connected with abominable tyranny and perilous imprisonment. . . . If a foolhardy person choose to expose himself to danger, so be it. Fools there will be on roads of iron and on roads of gravel, and they must suffer for their folly; but why are Socrates, Solon, and Solomon to be locked up?" His conclusion was that "the first person of rank who is killed will put everything in order, and produce a code of the most careful rules. I hope it will not be one of the bench of bishops, but should it be so destined, let the burnt bishop—the unwilling Latimer—remember that, however painful gradual concoction by fire may be, his death will produce unspeakable benefit to the public. Even Sodor and Man will be better than nothing. From that moment the bad effects of the monopoly are destroyed. No more fatal deference to the directors, no despotic incarceration, no barbarous inattention to the anatomy and physiology of the human body, no commitment to locomotive prisons with (without) warrant. We shall then find it possible

'Voyager libre sans mourir.'

Yet Sydney Smith had a warm regard and thankfulness for those whom he designated, with happy alliteration, as "vendors of velocity and traders in transition;" and when, at the age of seventy-three, he wrote to the papers, making the burden of his song

"The good of ancient times let others
state,
I think it lucky I was born so late"—

he made it one of the subjects of rejoicing over the improvements he had experienced in life, that "it took me nine hours to go from Taunton to Bath before the invention of railroads, and I now go in six hours from Taunton to London."

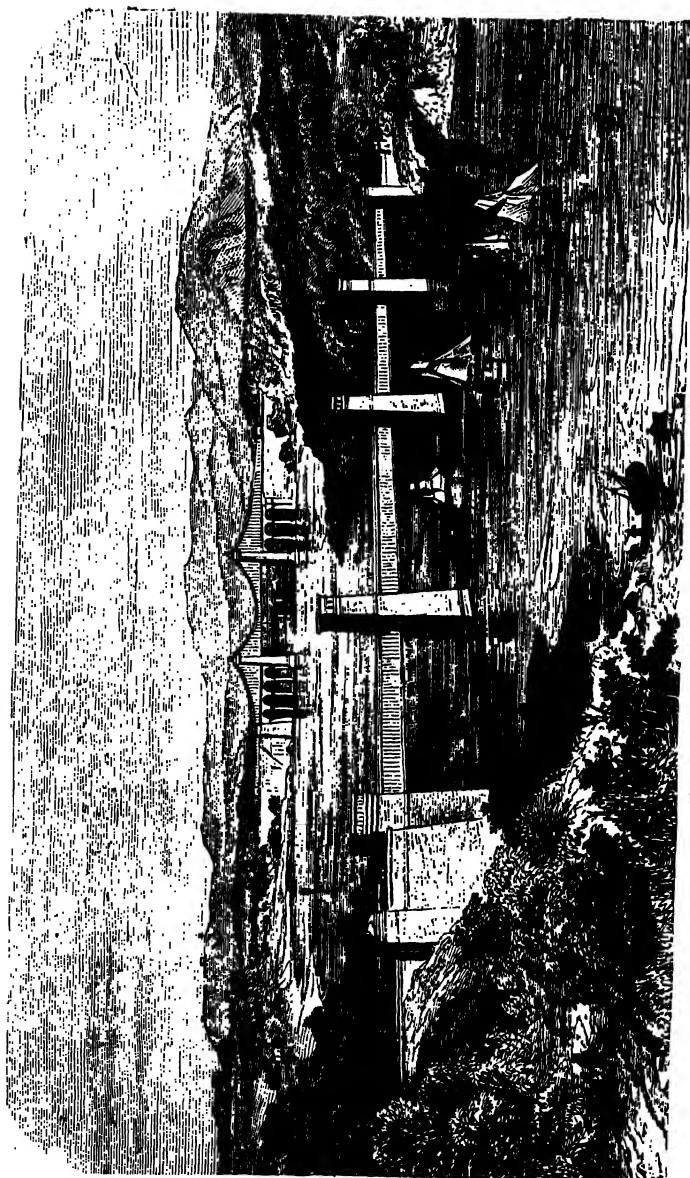
The *Quarterly Review* was the victim of complete reversal of its opinions on railways, and the same journal which ridiculed the steam carriage in one decade was fain to write thus of it in the next:—

"On recovering from the confusion consequent on passing rapidly through the air, one of the most pleasing novelties which first attract the attention of the traveller as, seated in his elbow chair, he joyously skims across the green fields, is to see the horses grazing at liberty in rich pasture, for it reminds him that the power of steam has at last emancipated those noble quadrupeds from the toilsome duties which, in the service of our mails and coaches, they have so long and so gallantly undergone, and that thus, for the first time in his life, he is travelling on land without the

slightest infliction of animal suffering."

Use has blunted the feelings of the people before whom the wonders of the railway were first unfolded; and what Sir E. Head wrote many years ago in his *Stokers and Pokers* is more and more applicable as time has developed its marvels:—

"When railways were first established, every living being gazed at a passing train with astonishment and fear! ploughmen held their breath; the loose horse galloped from it, and then, suddenly stopping, turned round, stared at it, and at last snorted aloud. But the 'nine days' wonder' soon came to an end. As the train now flies through our verdant fields, the cattle grazing at each side do not even raise their heads to look at it; the timid sheep fears it no more than the wind; indeed, the hen-partridge, running with her brood along the embankment of a deep cutting does not even crouch as it passes close by her. It is the same with mankind. On entering a railway station we merely mutter to a clerk in a box where we want to go—say 'How much?'—see him horizontally poke a card into a little machine that pinches it—receive our ticket—take our place—read our newspaper—on reaching our terminus drive away perfectly careless of all or of any one of the innumerable arrangements necessary for the astonishing luxury we have enjoyed."



MESAI TUBULAR AND SUSPENSION BRIDGES.



CHAPTER III.

So I left my own valley, where soft waters shine,
I joined the wild navvies to work on the line,
And dwell far away in the stranger's rude home,
Where the black mountains rise and the brown rivers foam.

We can level the mountain and tunnel the rock,
And scatter their fragments like ashes and smoke,
Till civilisation and commerce shall run,
And bless every nation beneath the bright sun.

JOHN TAYLOR.

REMARKABLE RAILWAY WORKS—THE CHAT MOSS—BRIDGE AT CHEPSTOW
—THE THAMES TUNNEL—THE EUSTON STATION—THE KILSBY AND
WATFORD TUNNELS—THE BRITANNIA BRIDGE—THE SOUTH DEVON
VIADUCTS—THE NIAGARA SUSPENSION BRIDGE—THE VICTORIA
BRIDGE, ST. LAWRENCE—THE MONT CENIS TUNNEL—THE CHANNEL
TUNNEL—TRESTLE BRIDGES IN AMERICA—THE TAY BRIDGE.

REMARKABLE RAILWAY WORKS.

THE construction of railways, has, in every country, to a greater or less extent, called into play the boldest and most brilliant efforts of the civil engineer. We have seen with how much admiration and wonder the canal works of Brindley and others were regarded in the previous century; but whether we regard the extent of the works generally, or the special instances in which engineering skill has been developed, the railway works of the nineteenth century far eclipse anything in the previous history of engineering. A favourite example to which appeal is made when contrasts are to be drawn between

the present and the past, is that of the Great Pyramid of Egypt. Taking up this example, one of the assistant engineers of the London and Birmingham line wrought out a comparison not very favourable to the boasted labour of Cheops. The ingenious writer reduces the works of this Pyramid to the well-known mechanical unit of the "foot pound," and proceeds to work out the following calculation. "After making the necessary allowance for the foundations, galleries, etc., and reducing the same to one uniform denomination, it will be found that the labour expended on the Great Pyramid was equivalent to

raising 15,763,000,000 cubic feet of stone one foot high. This labour was performed, according to Diodorus Siculus, by 300,000 men, and according to Herodotus by 100,000 men, and it required for its execution twenty years. If we reduce in the same manner the labour expended in constructing the London and Birmingham Railway to one common denomination, the result is 25,000,000,000 cubic feet of material reduced to the same weight as that used in constructing the pyramid, lifted one foot high, or 9,267,000,000 cubic feet more than were lifted one foot high in the construction of the pyramid. Yet this immense undertaking has been performed by about 20,000 men in less than five years." In this calculation, it is to be remembered that Cheops had not the aid of steam in his work, but possibly that remark lessens the value of the contrast as in favour of the modern engineer.

THE CHAT MOSS.

One of the most remarkable achievements in railway engineering was also one of the earliest, namely, the construction of a road over the Chat Moss, a bog with an area of twelve square miles, and of such softness that cattle could not walk on it, and in many parts of which a piece of iron would sink by its own weight. When the proposal was before Parliament that this bog (which was supposed to have had its origin at the

Deluge !) should be crossed by a solid railway, an opposing engineer of great eminence declared it was a thing which "no man in his senses" would undertake to do. George Stephenson, however, resolved to do it, and after severe labour and the exercise of much ingenuity, the task was accomplished. The drainage of the Chat Moss was commenced in June 1826. Nothing more impassable could have been imagined than that dreary waste; and it was declared that no carriage could stand on it "short of the bottom." In this bog, singular to say, Mr. Roscoe, the accomplished historian of the *Medicis*, had buried his fortune in the hopeless attempt to cultivate it. Nevertheless, farming operations had for some time been going on, and were extending along the verge of the Moss; but the tilled ground, underneath which the bog extended, was so soft that the horses when ploughing were provided with flat-soled shoes to prevent their hoofs sinking deep into the soil.

For weeks the stuff was poured in, and as little or no progress seemed to have been made, the directors of the railway became alarmed, fearing that the evil prognostications of the opposing engineers were about to be realised. But when Mr. Stephenson was asked for his opinion his invariable answer was, "We must persevere." Still the insatiable bog gasped for more material, which was emptied in truck-load after truck-load without any apparent effect. Then a

special meeting of the Board was summoned, and it was held upon the spot, to determine whether the work should be proceeded with or *abandoned*. Mr. Stephenson himself afterwards described the transaction at a public dinner given at Birmingham on the 23d of December 1837, on the occasion of a piece of plate being presented to his son, the engineer of the London and Birmingham Railway. He related the anecdote, he said, for the purpose of impressing upon the minds of all who heard him the necessity of perseverance.

"After working for weeks and weeks," said he, "in filling in materials to form the road, there did not yet appear to be the least sign of our being able to raise the solid embankment one single inch : in short, we went on filling in without the slightest apparent effect. Even my assistants began to feel uneasy, and to doubt of the success of the scheme. The directors, too, spoke of it as a hopeless task, and at length they became seriously alarmed ; so much so, indeed, that a Board meeting was held on Chat Moss to decide whether I should proceed any farther. They had previously taken the opinion of other engineers, who reported unfavourably. There was no help for it, however, but to go on. An immense outlay had been incurred ; and great loss would have been occasioned had the scheme been then abandoned and the line taken by another route. So the directors were *compelled* to allow me to go

on with my plans, of the ultimate success of which I myself never for one moment doubted. Determined, therefore, to persevere as before, I ordered the work to be carried on vigorously ; and to the surprise of every one connected with the undertaking, in six months from the day on which the Board had held its special meeting on the Moss, a locomotive engine and carriage passed over the very spot with a party of the directors' friends on their way to dine at Manchester."

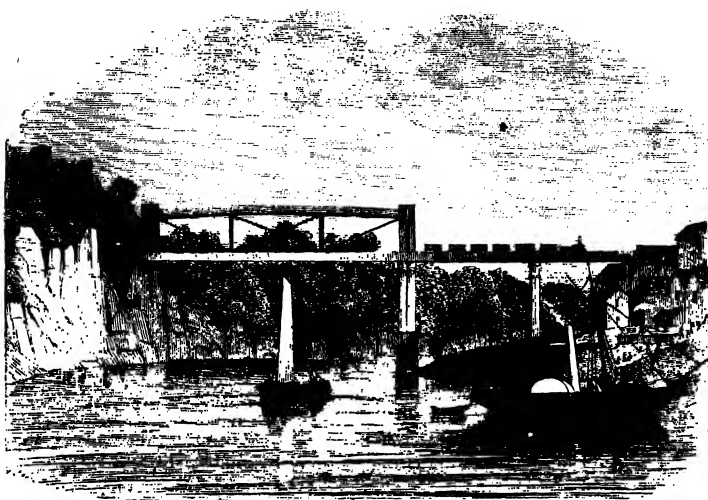
This great and original work has, we believe, only one counterpart. A great part of the line from Norwich to Yarmouth, of which railway Mr. Stephenson was chairman, passes over a morass, formerly, no doubt, occupied by the sea, and which in many places is so soft that no animal can walk over it without sinking. The railway was constructed across these lowlands by fir-poles laid transversely and covered with fascines, upon which the permanent way is laid with light materials. There can be no doubt, though the passengers may not know it, that this is nothing more than a floating road. The plan of using hurdles interwoven with boughs was that adopted by Stephenson in laying the road over the Chat Moss.

BRIDGE AT CHEPSTOW.

Standing midway between Telford's suspension principle and Stephenson's tubular principle, as

these are illustrated in the two magnificent bridges crossing the Menai Straits, is Mr. I. K. Brunel's singular bridge over the Wye at Chepstow, of which we give an illustration. There are in all four spans, three of them 100 feet each, and consisting of girders resting upon cylinders of concrete in an iron casing. The fourth and

largest span, 290 feet in length, combines the suspension and tubular principle; a tubular structure, 310 feet long and 9 feet in depth, being borne upon towers raised above the level of the piers, and bearing up the girders of the bridge by suspension ties. The tide on the Wye at Chepstow is one of the most marked in the



kingdom, ranging from 50 to 60 feet, and hence the bridge required to be very high to provide the necessary fair way at high-water of spring tides. In sinking the foundations for this bridge, and raising the girders to their place, some remarkable engineering operations were undertaken, but their character will be better illustrated in connection with later works.

THE THAMES TUNNEL.

Although the Thames Tunnel was not originally made for railway purposes, and was indeed projected by the famous engineer, Sir Marc Isambard Brunel, when as yet railways were in the chrysalis state, yet, as the work now forms part of the railway system of London, it deserves now to be ranked with the wonderful works

to which railways have given birth. It is said that the idea presented itself to Brunel in connection with the river Neva at St. Petersburg, the view being to escape the floating ice which sometimes obstructed the channel of that river. Certain it is, however, that his was not the first attempt to provide a mode of reaching the Surrey side of the Thames, "below bridge," without the necessity of taking to the "trim-built wherry" of the Thames watermen.

In 1799 an attempt was made to construct an archway under the Thames from Gravesend to Tilbury by Ralph Dodd, a portrait-painter, who afterwards attained some eminence as an engineer, but the whole of the funds were spent in the attempt to sink the shaft. In 1805, however, the "Thames Archway Company" commenced a similar work from Rotherhithe to Limehouse, under the direction of Vazie and Trevethick, two Cornish engineers. The horizontal excavation, in the latter case, had reached 1040 feet, or within 200 feet of the other side, when, on 26th January 1808, the ground broke in under the pressure of high tides, and the work was abandoned, fifty-four engineers declaring it impracticable to make a tunnel under the Thames of any useful size for commercial progression!

The idea on which Brunel founded his plan for executing a practicable tunnel through the moist river-bed of the Thames was suggested to the engineer in 1814, when he was engaged at Chatham

in the construction of saw-mills and other works in connection with the naval establishment there. Passing one day through the yard, he saw part of the keel of a vessel, which had been sawn through longitudinally, exposing the perforations of the sea-worm known as the *Teredo navalis*, an animal which bores a tunnel for itself, securing the sides of it by a calcareous secretion. After several years' plan by which the Thames Tunnel was to be made evolved itself from the germ of thought to which Brunel's observation of the habits of the animal gave rise.

Accordingly, in 1823, Brunel came before the public with a proposal based on the principle of the teredo, the auger-like head of that animal being represented by the "shield" behind which the labourers worked. Brunel's first idea had been to imitate the animal pretty exactly, making a circular shield, turning on its own axis, and advancing with a kind of corkscrew motion as the tunnel progressed. But the "teredo" shield he first contrived gave place to the square shield by which the Thames Tunnel was subsequently made. This shield was divided into twelve parts horizontally, and behind each part was an iron structure so contrived that three tiers of men could work at one time. The principle was that the odd-numbered divisions and the even-numbered divisions should be advanced alternately, each being in turn *three inches* in advance of the other. The divi-

sions were about three feet wide, and in front of each workman was a series of thick wooden boards, pressed against the face of the soil by poles, and hence called "poling boards." Carefully removing one board, the workman cut away the soil for three inches in advance, and replaced the board, resting the retaining pole against not his own division of the shield but the divisions to right and left. When all the three tiers of men had thus cut away the soil in front, and rested the poles on the adjoining divisions, their own division was free from the pressure of the soil, and could then be moved forward. It was moved forward six inches, and then the workmen repeated the operation of taking out the boards *seriatim*, cutting away other three inches of the soil, and replacing the board with its poles resting on their own proper division. Suppose we have been here describing division No. 3: on the completion of this operation the men at Nos. 2 and 4 would begin to work till they had got their division of the shield three inches in advance of No. 3, and so on, the way being thus gained inch by inch. If the soil was pretty solid in front, the men were sometimes allowed to lift out two of the "poling boards" at a time, but if wet, or loose, the greatest care had to be taken lest a complete rush in of the treacherous soil should result. As the work advanced, the permanent brickwork of the tunnel was built in, the men in the shield representing

the boring power of the *Teredo navalis*, while the bricklayers acted the part of the secreting apparatus with which that curious marine animal is provided. Altogether the invention was a most ingenious mechanical imitation of a fact in nature, such as was seen in a later though perhaps less remarkable invention, when Sir Joseph Paxton reproduced the structure of the leaves of the *Victoria Regia* in the design for the Crystal Palace of 1851.

Great as was the confidence of Mr. Brunel in his shield, it is probable that he never anticipated the obstacles he actually experienced, principally from the character of the soil and the extraordinary influence which the tides exercised even at the depth of the tunnel. The first nine feet of the tunnel, which was commenced in the year 1826, passed through firm clay. The clay was succeeded by a loose watery sand, where every movement was attended with imminent hazard. Thirty-two anxious days were passed in this part. On the 14th of March more solid ground was again reached, and matters went on prosperously till the September following, when 260 feet had been completed.

On the 14th of that month, the engineer startled the directors with the information that the bottom of the river, just beyond the shield, would probably break down with the coming tide. It appears he had discovered a cavity above the top of the shield. Exactly at high tide, the miners heard the noise of the fall-

ingsoil upon the head of their shield, and saw bursts of water follow; but so complete were the precautions taken, that no injury ensued, and the cavity was soon filled by the river itself. After another month a similar occurrence took place.

By the 2d of January 1827, 350 feet had been accomplished, when the tide, during the removal of one of the poling-boards, forced through the shield a quantity of loose clay; but still no irruption of the river itself took place, though the fear of this, from the commencement to the termination of the work, was continually on every one's mind.

At last, on the 18th of May 1827, the river did actually break in for the first, and as it proved unfortunately not for the last time. The disaster was chiefly caused by two vessels coming in at a late tide, and mooring just above the head of the tunnel, causing a great washing away of the soil around them. Mr. Beamish, the resident engineer has given a graphic description of the irruption:—

"As the water," he writes, "rose with the tide, it increased in the frames very considerably between Nos. 5 and 6, forcing its way at the front, then at the back; Ball and Compton (the occupants) were most active. About a quarter before six o'clock, No. 11 (division) went forward. Clay appeared at the back, and I had it closed up immediately. While this was going forward, my attention was again called to No. 6, where I found the gravel forcing itself in

with the water. It was with the utmost difficulty that Ball could keep anything against the opening. Fearing that the pumpers would now become alarmed, as they had been once or twice before, and leave their post, I went upon the east stage to encourage them, and to choose more shoring for Ball. Godwin, who was engaged at No. 11, where the indications of a run appeared, called to Rogers, who was in the act of working down No. 9, to come to his assistance. But Rogers, having his second poling-board down, could not. Godwin again called. I then said to Rogers, 'Don't you hear?' upon which he left his poling for the purpose of assisting Godwin; but before he could get to him, and before I could get fairly into the frames, there poured such an overwhelming volume of water and sludge as to force the men out of the frames. William Carps, a bricklayer, who had gone to Godwin's assistance, was knocked down and literally rolled out of the frames on the stage, as though he had come through a mill-slucce. . . .

"Rogers (an old sergeant of the Guards), the only man left upon the stage, now caught my arm, and gently drawing me from the frames, said, 'Come away; pray, sir, come away; 'tis no use, the water is rising fast.' I turned once more; but hearing an increasing rush at No. 6, and finding the column of water at Nos. 11 and 12 to be augmenting, I reluctantly descended. The cement-casks,

compo-boxes, pieces of timber, were floating around me. I turned into the west arch, where the enemy had not yet advanced so rapidly, and again looked towards the frames, lest some one might have been overtaken; but the cement-casks, etc., striking my legs, threatened seriously to obstruct my retreat, and it was with some difficulty I reached the bar placed to keep the visitors from the unfinished works, where Mayo, Bertram, and others, were anxiously waiting to receive me. . . . I was glad of their assistance; indeed, Mayo fairly dragged me over it. Not bearing the idea of so precipitate a retreat, I turned once more; but vain was the hope! The wave rolled onward and onward; the men retreated, and I followed. As we approached, I met Isambard Brunel. We turned round; the effect we saw was splendid beyond description. The water as it rose became more and more vivid, from the reflected lights of the gas. As we reached the staircase a crash was heard, and then a rush of air at once extinguished all the lights. . . . Now it was that I experienced something like dread. I looked up the shaft, and saw both stairs crowded; I looked below, and beheld the overwhelming wave appearing to move with accumulated velocity.

"Dreading the effect of the reaction of this wave from the back of the shaft upon our staircase, I exclaimed to Mr. Gravatt, 'The staircase will blow up!' I. Brunel ordered the men to get up

with all expedition; and our feet were scarcely off the bottom stairs when the first flight, which we had just left, was swept away. Upon our reaching the top, a bustling noise assailed our ears, some calling for a raft, others for a boat, and others again for a rope; from which it was evident that some unfortunate individual was in the water. I. Brunel instantly, with that presence of mind to which I have been more than once witness, slid down one of the iron ties, and after him Mr. Gravatt, each making a rope fast to old Tillet's waist, who, having been looking after the packing of the pumps below the shaft, was overtaken by the flood. He was soon placed out of danger. The roll was immediately called—*not one absent.*"

The diving-bell was now brought into use; the hole or chasm in the bed of the river was discovered, and 3000 bags of clay, armed with small hazel rods, were expended before it was effectually closed.

In a few weeks the water was got under, and by the middle of August the tunnel was cleared of the soil that had washed in, and the engineer was able to examine his shattered fortifications. In all essentials the structure remained perfectly sound, though a part of the brickwork close to the shield had been washed away to half its original thickness, and the chain which had held together the divisions of the shield had snapped like a cotton thread. The enemy—so powerless when kept at a distance, so irresistible at its full

strength—had driven deep into the ground heavy pieces of iron belonging to the shield.

“Amid all these dangers,” says Mr. Thornbury, “the men displayed great courage and perseverance. Brunel’s genius had roused them to a noble and generous disregard of the opposing principles of nature. The alarms were frequent, the apprehension incessant. At any moment the deluge might come; and the men worked, like labourers in a dangerous coal mine, in constant terror from either fire or water. Now and then a report like a cannon-shot would announce the snap of some portion of the overstrained shield; sometimes there were frightened cries from the foremost workers, as the earth and water rushed in and threatened to sweep all before them. At the same time, during these alarming irruptions, large quantities of carburetted and sulphuretted hydrogen would burst into fire, and wrap the whole place in a sudden sheet of flame. Those who witnessed these explosions describe the effect of the fire dancing on the surface of the water as singularly beautiful. The miners and bricklayers, encouraged by the steadfast hand at the helm, got quite accustomed to these outbursts, and, at the shout of fire and water! used to cry, ‘Light your pipes, my boys!’ reckless as soldiers in the trenches.”

But still worse than these violent protests of Nature was a more subtle and deadly enemy

The air grew so thick and impure, especially in summer, that sometimes the most stalwart labourers were carried out insensible, and all the workmen suffered from headache, sickness, and cutaneous eruptions. It was a great struggle, nobly borne. They shared Brunel’s anxieties, and were eager for a share of his fame, for he had inspired the humblest hodman with something of his own high impulse. “It was touching,” writes a chronicler of the tunnel, “to hear the men speak of Brunel. As in their waking hours these men could have no thought but of the tunnel, so, no doubt, did the eternal subject constantly mingle with their dreams, and harass them with unreal dangers. One amusing instance may be mentioned. Whilst Mr. Brunel jun. was engaged one midnight superintending the progress of the work, he and those with him were alarmed by a sudden cry of ‘The water! the water!—wedges and straw here!’ followed by an appalling silence. Mr. Brunel hastened to the spot, where the men were found perfectly safe. They had fallen fast asleep from fatigue, and one of them had been evidently dreaming of a new irruption.”

By January 1828 the middle of the river had been reached, and no human life had yet been sacrificed. But, as if the evil principle had only retired for a fresh attack, a terrible crisis now came. “I had been in the frames,” says Mr. I. K. Brunel, in a letter addressed to the directors on the fatal Satur

day, August 12, 1828, "with the workmen throughout the whole night, having taken my station there at ten o'clock. During the workings through the night no symptoms of insecurity appeared. At six o'clock on this morning (the usual time for shifting the men) a fresh set came on to work. We began to work the ground at the west top corner of the frame. The tide had just then begun to flow, and finding the ground tolerably quiet, we proceeded by beginning at the top, and had worked about a foot downwards, when, on exposing the next six inches, the ground swelled suddenly, and a large quantity burst through the opening thus made. This was followed instantly by a large body of water. The rush was so violent as to force the man on the spot where the burst took place out of the frame (or cell) on to the timber stage behind the frames.

"I was in the frame with the man, but upon the rush of water I went into the next box in order to command a better view of the irruption; and seeing there was no possibility of there opposing the water, I ordered all the men in the frames to retire. All were retiring except the three men who were with me, and they retreated with me. I did not leave the stage until those three men were down the ladder of the frames, when they and I proceeded about twenty feet along the west arch of the tunnel. At this moment the agitation of the air by the rush of the water was such as to ex-

tinguish all the lights, and the water had gained the height of the middle of our waists.

"I was at that moment giving directions to the three men, in what manner they ought to proceed in the dark, to effect their escape, when they and I were knocked down and covered by a part of the timber stage. I struggled under water for some time, and at length extricated myself from the stage, and by swimming and being forced by the water I gained the eastern arch, where I got a better footing, and was enabled, by laying hold of the railway rope, to pause a little in the hope of encouraging the men who had been knocked down at the same time with myself. This I endeavoured to do by calling to them. Before I had reached the shaft, the water had risen so rapidly that I was out of my depth, and therefore swam to the visitors' stairs, the stairs of the workmen being occupied by those who had so far escaped. My knee was so injured by the timber stage that I could scarcely swim or get up the stairs, but the *rush of the water carried me up the shaft*. The three men who had been knocked down with me were unable to extricate themselves, and I grieve to say they are lost, and I believe also two old men and one young man in other parts of the work."

At this crisis the funds of the company were exhausted, and everything seemed against the successful continuation of the enterprise. The hole in the river-

bed was reported by the divers to be very formidable. It was oblong and measured about seven feet in length. Brunel, whose tenacity of purpose was immovable, was almost in frenzy at this accident. The hole was patched up in the bed of the river, forty thousand tons of earth—chiefly clay, in bags—being employed for the purpose, and the tunnel remained as substantial as ever. But for seven long years all further work upon it was suspended.

In January 1835 the Government, after many applications, agreed to make some advances for the continuation of the work, and it was once more resumed with energy. The progress at first was not much to speak of, even though the workmen laboured energetically during the first eighteen weeks. It was only two feet four inches per week.

"The ground in front of the shield was, from excessive saturation, almost constantly in little better than a fluid state, and an entirely new and artificial bed had to be formed in the river in advance, and brought down till it was deep enough to occupy the place of the natural soil where the excavation was to be made, and that time must be allowed for its settlement, whenever the warning rush of sand and water was heard in the shield. Lastly, owing to the excavation being so much below that of any other works around the tunnel, it formed a drain and receptacle for all the water of the neighbour-

hood. This was ultimately remedied by the sinking of the shaft on the Wapping side. Yet it was under such circumstances that the old shield injured by the last irruption was taken away and replaced by a new one, and this was executed by Brunel without the loss of a single life. But fresh difficulties arose; the expenditure had been so great that the Lords of the Treasury declined to make further advances without the sanction of Parliament. The examination of Mr. Brunel and the assistant engineers before a Parliamentary Committee led, however, to favourable results, and the work was again renewed."

In August 1837 a third irruption and several narrow escapes occurred. "The water," says Mr. Thornbury, "had gradually increased at the east corner since 2 P.M. on the 23d, rushing into the shield with a hollow sound, as though it fell through a cavity in the river-bed. A boat was then sent into the tunnel to convey material to block up the frames. Notwithstanding, the water gained upon the men and rapidly rose in the tunnel. About 4 P.M., the water having risen to within seven feet of the crown of the arch, it was thought wise for the men to retire, which they did with great courage along a platform constructed by Mr. Brunel in the east arch only a few weeks before. As the water still continued rising after the men left, Mr. Page, the acting engineer, and four others, got into the boat, in order to

reach the stages and see if any change had taken place; but after passing the 600 feet mark in the tunnel, the line attached to the boat ran out, and they returned to lengthen it. This accident saved their lives, for while they were preparing the rope the water surged up the arch ten or twelve feet. They instantly made their way to the shaft, and Mr. Page, fearing the men might get jammed in the staircase, called to them to go steadily; but they, misunderstanding him, returned, and could hardly be prevailed upon to go up. Had the line been long enough, all the persons in the boat must have perished, for no less than a million gallons of water now burst into the tunnel in a single minute. The lower gas-lights were now under water, and the tunnel was almost in darkness. The water had risen to within fifty feet of the entrance of the tunnel, and was advancing in a wave. As Mr. Page and his assistants arrived at the second landing of the visitors' stairs, the waves had risen up to the knees of the last man.

"The next irruption was in November of the same year, when the river burst in about four in the morning, and soon filled the tunnel. Excellent arrangements, however, had been made for the safety of the men, and all those employed at the time—there were seventy or more of them—escaped, excepting one—he alone did not answer when the roll was called. The fifth and last serious irruption took place on the 6th of

March 1838. A noise like thunder preceded it, but it was attended by no loss of life."

The last feeble struggle of the river against its persistent enemy was in April 1840. About eight A.M., it being then low water, during a movement of the poling boards in the shield, a quantity of gravel and water rushed into the frame. The ground rushed in immediately, knocking the men out of their cells, and they fled in a panic; but, finding the water did not follow, they returned, and by great exertions succeeded in stopping the run, after upwards of 6000 cubic feet of soil had fallen into the tunnel. The fall was attended with a noise like thunder and the extinguishing of all the lights. At the same time, to the horror of Wapping, part of the shore in that place sank, over an area of upwards of 700 feet, leaving a cavity on the shore of about 30 feet in diameter and 13 feet in depth. Had this taken place at high water the tunnel would have been filled; as it was, men were sent over with bags of clay and gravel, and everything rendered secure by the return of the tide.

Sometimes sand, nearly fluid, would ooze through minute cracks between the poling boards of the shield, and leave large cavities in the ground in front. On one of these occasions, the sand poured in all night and filled the bottom of the shield. In the morning, on opening one of the faces, a hollow was discovered, 18 feet long, 6 feet high, and 6 feet deep.

This cavity was filled up with brickbats and lumps of clay. One of the miners was compelled to lay himself down in this cavity, for the purpose of building up the farther end, though at the risk of being buried alive.

At last, on the 13th of August 1841, Sir Isambard Brunel passed down a shaft which had been opened to facilitate the work on the Wapping side of the Thames, and thence by a small drift-way through the shield into the tunnel. The difficulties of the great work had been at last surmounted.

Sub-river tunnels, it may be added, are not unfrequent in the coal-mining districts of the north of England. The beds of both the Tyne and the Wear are pierced in this manner; while at Whitehaven, and at the Botallack mines in Cornwall, the bed of the ocean has been penetrated for long distances, the tunnel at the former place extending upwards of a mile beneath the sea. At the close of the last century, Mr. Dodd proposed a subaqueous passage to connect North and South Shields, but the scheme was never carried out.

A few years ago, Mr. Barlow a practical engineer, offered, at a cost of £16,000, in less than a year, to bore a subway through the bed of the Thames. Brunel's tunnel, it must be remembered, had cost half a million of money and sixteen years' labour to complete. Mr. Barlow, with less ambition and genius, but perhaps more common sense and thrifti-

ness than his great predecessor, took care to remember that the crown of Brunel's arches, in some places, came within 4 feet of the river water. In the subway from the Tower to Tooley Street the average distance preserved is 30 feet, and in no place is there less than 18 feet of sound London clay between the arch and the tideway. The cardinal principle of Mr. Barlow was to sink deep into the London clay, which is as impervious to water as stone, and in which no pumping would be required.

The works were begun on February 16, 1869, by breaking ground for the shaft on the north side of the river; in February 1870, numerous visitors were conveyed from one shaft-head to the other. The length of the whole tunnel is about 1340 feet, or as nearly as possible about a quarter of a mile. From Tower Hill it runs in a south-west direction, and passing under Barclay's brewery, emerges under a shaft similar to that at entering, but only 50 feet deep, and out of this the passengers come within a few yards of Tooley Street, close to the railway station. From the Tower Hill shaft to the centre of the river the tunnel makes a dip of about one in thirty. From this point it rises again at the same incline to what we may call the Tooley Street Station.

The method of constructing the tunnel was simple in the extreme; it having been built in 18-inch lengths of cast-iron tubing, per-

fectly circular, each 18-inch circle being built up of three segments, with a key-piece at the top, which, fitting in like a wedge, holds the rest with the rigidity of a solid casting. The cast-iron shield used for excavation was less than $2\frac{1}{2}$ tons weight. In front of the shield was an aperture about 2 feet square, closed with a sliding iron water-tight door, and at the back of the shield were iron sockets, into which screw-jacks fitted, and forced the shield forward. Through the water-tight door in the centre sufficient clay was cut away by hand till a chamber was made large enough for a man to enter, and he worked till there was room for two, and these soon made a circular space exactly the size of the shield, and about 2 feet deep. This done, the miners came out, and with their screw-jacks forced the shield forward into the space which they had cut. An 18-inch ring was quickly put in and bolted together; and while this was doing, the clay was being excavated from the front of the shield as before. Thus every eight hours, night and day, Sundays and week-days, the shield went forward 18 inches, and 18 inches length of iron was added to the tube, which so advanced at the rate of 5 feet 4 inches every twenty-four hours.

The clay was so completely water-proof, that water had to be sent down to the workmen in cans to mix with the cement. The gain to the east end of London by this successful and cleverly

executed undertaking is enormous, and the intercourse between the north and south banks' of the Thames is greatly facilitated; and the conception has been seized upon as the basis of the suggestion of a submarine railway from England to France. The Thames tube originally carried a railway of 2 feet 6 inches gauge, on which ran an omnibus capable of conveying twelve passengers. The omnibus, which was constructed of iron, and ran upon eight wheels, was connected with a rope of steel wire, and at each end of the tunnel this wire ran over a drum worked by means of a stationary engine. The subway is now, however, only used for foot-passengers, at a charge of one halfpenny.

EUSTON STATION.

Although the Grecian *Propylæum* or gateway at Euston station has been eclipsed in pretentiousness by the more modern buildings at St. Pancras or Charing Cross, where an hotel front is made a portion of the design, yet in regard of elegance and purity of design, this entrance gate remains unsurpassed in railway architecture. It is thus described by Mr. Britton, in his notes to a beautiful folio volume of engravings published in 1839, to illustrate the construction of what was then looked upon as the greatest work of its age, the London and Birmingham Railway:—"Separating the station from the public street is the *Propylæum*, or architectural

gateway, with four lodges or offices connected with it, intermediate to which, and in combination with the whole, are large, lofty, and ornamental iron gates. The *Propylæum* is remarkable for magnitude and simplicity of arrangement, and for its strictly classical character. It is indeed a most successful adaptation of the pure Grecian Doric; admirably suited, by the massiveness and boldness of its design and execution, for an approach to a line of communication connecting the British metropolis with the most important towns in the kingdom. Objection has been taken, and with some appearance of reason, to the great expense of this ornamental entrance; in reply to which it may be said, that the railway is a great national undertaking, and that the national character is, in some respects, involved in the execution of the whole." In the *Companion to the British Almanac* of 1839, reference is made to this fine work. The writer says:—"As a specimen of Greek architecture, this structure has not only the merit of being upon a grander scale than anything of the kind yet attempted in this country, but also free from any adulteration of the style by the admixture of features which, however well they may be designed in themselves, almost invariably detract more or less from classicality of design. . . . The Grecian outline is preserved entire, on which account the structure exhibits itself to most advantage when viewed obliquely, so as to

show its line of roof and depth, especially as the cornice is of unusually bold and new design, being not only ornamented with projecting lions' heads, but crowned by a series of deep antifixæ; while, when beheld from a greater distance, the large stone slabs are also seen that cover the roof." The entire length of the front is above 300 feet, and the total cost of the building, etc., was £35,000. The columns were, at their date, the largest in London, being 44 feet high to the abacus; but they are not monoliths, being built in courses. The architect of this beautiful gate was Mr. Philip Hardwick.

THE KILSBY AND WATFORD TUNNELS.

These were two of the great works of the London and Birmingham line, and for a time were reckoned amongst the marvels of railway engineering. The Kilsby tunnel is 2398 yards long, or a mile and a third; and in its construction vast quantities of water and quicksand were encountered, which rendered it a work of great difficulty. The first contractor undertook to cut the tunnel for £93,000, but failed, and the company had to take the work into its own hands, eventually spending above £300,000 on the work, or £125 per yard forward. It was wrought at eighteen different places at once by means of shafts, and two of those shafts have been left for ventilation, one 90, the other

130 feet in depth, and each 60 feet in diameter. In constructing the tunnel 177,000 cubic yards of material were removed, and thirty millions of bricks were used in forming the archway. 1300 men were constantly engaged on the tunnel till it was completed, besides 12 steam-engines, working day and night, to pump water out and remove the excavations. In the case of the Watford tunnel, which is exactly a mile long, the work was through a stratum of chalk, with intervals of loose gravel and running sand, rendering the execution of the work both difficult and dangerous. On one occasion ten men were killed by a rush of sand and gravel through an opening in the chalk, and to extricate their bodies a large shaft was sunk, at great expense. Six working shafts were sunk, and, in making the tunnel, the soil was only cut away a short distance—six feet—in advance of the brickwork. This tunnel cost £140,000, being about £80 per lineal yard forward.

THE BRITANNIA BRIDGE.

To borrow a phrase which Charles Dickens has made classical, we may say that the tubular bridge built to carry the Chester and Holyhead Railway over the Menai Straits is "one of the most remarkable works in the country." It was remarkable in many ways: in the careful adaptation of means to end on the part of the engineer; in its victory over requirements with regard to navigation which

seemed for a time to make the erection of a railway bridge at such a place impossible; and in the grace and beauty which, in the end, the grand design proved itself to possess.

Being a work of national importance, the magnitude of the operations connected with it, the immense expenditure required for its execution, and the great interests which depended on its success, were all circumstances which commanded general attention. The principles of engineering illustrated in its construction were arrived at after an elaborate series of experiments unparalleled for their magnitude and interest, in which Sir William Fairbairn took a prominent part.

The narrow strait which separates the island of Anglesea from Carnarvonshire is deeply sunk below the level of the land, and has rocky and precipitous banks on each side. Its width of waterway varies from about 1000 feet to three-quarters of a mile, and the average height of the shores on each side is above 100 feet. The usual mode of passing the Straits was by descending the bank, crossing by a ferry, and ascending again on the other side, by which much inconvenience was caused. These difficulties at length drew the attention of Government to the matter; and a beautiful suspension bridge, designed by Telford, was begun in 1820, and finished in 1826.

To carry a railway across the Straits was, however, an enterprise

of almost insuperable difficulty, and would have been perhaps impracticable, had not the plan of a tubular bridge, suggested by Robert Stephenson, been attempted. To avoid interference with the shipping, it had been required by the Admiralty that there should be a clear span of 400 feet in the bridge to be constructed. The largest arched span, however, previously constructed, did not exceed 240 feet; and as suspension bridges were not supposed to be suitable for heavy railway traffic, Stephenson was obliged to devise some new form of bridge which would admit of the necessary requirements. He therefore proposed a tubular bridge of about 1800 feet in length, to be placed on two piers, one on the Anglesea side, another on the Carnarvon side, and a great tower in the centre, 230 feet high, which would be erected on the Britannia Rock in the middle of the Strait.

The particular spot selected was a mile distant from Telford's bridge.

In the construction of the tubular bridge, two pairs of short tubes, 250 feet long, for the space between the ends of the railway and the Anglesea and the Carnarvon piers respectively, were built on scaffolding at the proper height and in the exact position which they now occupy. To span the distance between these piers and the Britannia tower, two immense wrought-iron arcades or tunnels, each 472 feet in length, were

constructed on timber platforms along the beach on the Carnarvon shore. These platforms were large flat-bottomed pontoons or barges, eight being used for each tube, and they were arranged under the tube in two groups of four, one near each end. Large valves were placed in the bottom of each barge, which were kept constantly open, and in this state the tide entered and left them daily without producing any buoyant effect.

One of the large tubes of which this tunnel consists, when seen on its platform, was compared to a street or row of chimneyless houses; and the labour of placing it on the piers had been likened to raising the Burlington Arcade upon the summit of St. James' Church, if surrounded with water. If placed on end in St. Paul's Churchyard, the tube would reach 107 feet higher than the cross of that cathedral.

The floating of the first tube, in June 1849, was an anxious and exciting operation. It was commenced by closing all the valves in the pontoons at low water. When the tide rose, they began to float, and shortly afterwards they bore the weight of the tube, which was at last raised by them entirely off its temporary supporting piers. About an hour and a half before high water, the current running about four miles an hour, the tube was dragged out into the middle of the stream by the aid of powerful capstans and hawsers, which

reached from the pontoons to the Britannia tower.

The speed and time of floating were so arranged, that when the tide became stationary before turning, which it does for fifteen minutes, the tube had just reached the towers, and in this interval had to be deposited on the projecting shelves at the foot of the towers, exactly under its final position. This was the most critical point of the whole. "The success of this operation," says Mr. Clark, "depended mainly on properly striking the butt beneath the Anglesea tower, on which, as upon a centre, the tube was to be veered round into its position across the opening. This position was determined by a 12-inch line, which was to be paid out to a fixed mark from the Llanfair capstan. The coils of the rope unfortunately over-rode each other upon this capstan, so that it could not be paid out. In resisting the motion of the tube, the capstan was bodily dragged out of the platform by the action of the pawls, and the tube was in imminent danger of being carried away by the stream, or the pontoons crushed upon the rocks. The men at the capstan were all knocked down, and some of them thrown into the water, though they made every exertion to arrest the motion of the capstan bars. In this dilemma, Mr. Charles Rolfe, who had charge of the capstan, with great presence of mind called the visitors on shore to his assistance, and, handing out

the spare coil of the 12-inch line into the field at the back of the capstan, it was carried with great rapidity up the field, and a crowd of people—men, women, and children—holding on to this huge cable, arrested the progress of the tube, which was at length brought safely against the butt and veered round. The Britannia end was then drawn into the recess of the masonry, by a chain passing through the tower to a crab on the far side. The violence of the tide abated, though the wind increased, and the Anglesea end was drawn into its place beneath the corbeling in the masonry; and, as the tide went down, the pontoons deposited their valuable cargo on the welcome shelf at each end. The successful issue was greeted by cannon from the shore, and the hearty cheers of many thousands of spectators, whose sympathy and anxiety were but too clearly indicated by the unbroken silence with which the whole operation had been accompanied." The valves of the pontoons were now opened, the water entered, destroying their buoyancy, and the tube was left suspended over the waters of the Strait by its two ends, which rested on the edges cut in the rock for its reception at the base of the Anglesea and Britannia towers. So accurately had the tube been constructed, that, after being put into its place, the clear space which remained between it and the rock was only about three quarters of an inch.

It was now necessary that it

should be lifted by hydraulic power to its permanent place near the summit of the towers. The hydraulic presses employed were three in number, two placed on the Britannia tower, and one on the Anglesea pier. This last was the largest in the world, and perhaps the most powerful machine of the kind ever constructed.

The water was forced into these presses by two steam-engines of 40-horse power, with tubular boilers as in a locomotive, one placed in each tower. The diameter of the pumps was one inch and one sixteenth; that of the ram of the hydraulic press twenty inches,—their respective areas being in the proportion of one to three hundred and fifty-four. The pipe through which the water was forced into the press was of wrought-iron, and not more than half an inch in diameter. The largest press had power enough to lift the whole tube, a weight of 1800 tons, and it was stated by Mr. Clark that it could spout the water pressed into its cylinder to a height of nearly 20,000 feet, or more than five times the height of Snowdon, and 5000 feet higher than Mont Blanc. And yet one man could, with the utmost facility and precision, guide and control this stupendous action. The chains descending to the tube below weighed about 100 tons. It was the original intention of Mr. Stephenson, having once begun to lift, to do so at both ends simultaneously, and so to continue making consecutive lifts as fast as

possible, by which the whole would have been accomplished in about eighteen hours; but the fear of any failure in the chains when the dead weight was hanging on them, made him adopt a slower method, by which one lift of six feet was made in the twenty-four hours, first at one end and then at the other, the tube being followed up underneath by wood-packings, which during the remainder of the day were taken out and replaced by solid masonry. Each lift took on an average 38 minutes. The operation was begun on Friday evening, 10th August, and till 16th August, when 27 feet had been reached, everything proceeded without impediment or failure.

On 17th August, when the engineers renewed their labour, the tube rose steadily to the height of 2 feet 6 inches, being closely followed up by the packing, when suddenly and without warning, the bottom of the hydraulic press gave way, separating completely from the body. The ram, cross-head, and chains descended violently on to the press with a tremendous noise, the tube sinking down upon the wooden packing beneath it, while the bottom of the press, weighing nearly $2\frac{1}{2}$ tons, fell on to the top of the tube, through a depth of 80 feet. A sailor, who was ascending from the tube to the pier, but was not engaged in the raising, was struck by a piece of the broken press, when he fell on to the tube, a height of 50 feet, and was so severely injured that

he died the next day. The tube was not injured in the above accident, but some of the lifting frames were broken, and these being repaired, the raising was resumed, and the final lift of the tube was accomplished on 15th October. It was raised three feet above the permanent level, so as to enable the engineers to join it on to the end or land tube, before laying it down on its bed-plates and permanent rollers placed beneath it; these rollers being requisite to enable the iron to expand and contract according to the variations in the temperature of the weather. This operation occupied about three weeks, when the tube was finally lowered. The hydraulic press and lifting apparatus were then removed from the Anglesea to the Carnarvon shore for the raising of the next large tube. This was successfully floated on 4th December; the raising was commenced on 18th December, both operations being conducted precisely as on the Anglesea shore, but without accident. It was set in its permanent place on the 7th January 1850, and the other tubes were floated and raised in due course.

The tubes, when raised, were joined at their ends, so that, as before stated, they form two tubes or tunnels, each upwards of a quarter of a mile long. The exact length of each is 1573 feet, and as it weighs 5290 tons, its size surpassed any piece of wrought-iron work previously put together. The junction of the tubes added

materially to their strength,—so much so, indeed, that, startling as it may at first appear, the bridge would stand securely even if the large tubes were to be cut through in the middle of the span. The parts which pass through the towers were very much strengthened with this view. The entire length of the bridge at rail-level is 1841 feet.

On the 5th of March 1850, Mr. Stephenson put the last rivet in the last tube, and passed through the completed bridge, accompanied by about a thousand persons, drawn by three locomotives. On the 18th March the bridge was opened for public traffic. In August the parallel line of tubes was completed, and the up and down trains then passed over the Menai Straits with as little delay and danger as on any other part of the line. The cost of the whole was over £600,000.

The total weight of iron used in the Britannia Bridge was nearly 12,000 tons. In fitting the plates of which it is composed together, not less than 2,000,000 bolts were riveted, weighing about 900 tons. The road within each tube is 15 feet wide, and the height varies from 23 feet at the ends, to 30 feet at the centre.

In his description of the bridge and the scene of its final completion, the author of *Highways and Dryways* says:—"In viewing this long narrow passage, it seemed surprising to us that by any arrangement of materials it could possibly be made strong enough to support

even itself, much less heavily laden trains of passengers and goods flying through it, and actually passing each other in the air at railway speed. And the more we called reason and reflection to our assistance, the more incomprehensible did the mystery practically appear; for the plate-iron of which this aerial gallery is composed is literally *not so thick* as the lid, sides, and bottom which, by heartless contract, are *required* for an elm coffin $6\frac{1}{2}$ feet long, $2\frac{1}{4}$ feet wide, and 2 feet deep — of strength merely sufficient to carry the corpse of an emaciated, friendless pauper from the workhouse to his grave.

“The covering of this iron passage, 1841 feet in length, is literally not thicker than the hide of an elephant! Lastly, it is scarcely thicker than the bark of the ‘good old English’ oak; and if this noble sovereign, notwithstanding the ‘heart’ and interior substance of which it boasts, is, even in the well-protected park in which it has been born and bred, often prostrated by the storm, how difficult it is to conceive that an attenuated aerial hollow beam, no thicker than its mere rind, should by human science be constituted strong enough to withstand, besides the weights running through it, the natural gales and artificial squalls of wind to which, throughout its immense length, and at its fearful height, it is permanently to be exposed!” The bridge has now been in use for quarter of a century; and while it has withstood elemental violence well, and

has become a mere everyday matter with us, an examination of its structure, or a perusal of its history, is not less calculated now than in 1850 to excite our wonder and admiration.

THE SOUTH DEVON VIADUCTS.

In a line of railway extending to about sixty miles in length, there are five miles of bridges and viaducts of the most gigantic description, designed by Mr. Brunel. The largest is the great Albert Bridge at Saltash, finished in 1859, and in which it is said that even greater difficulties were overcome than in the Britannia Bridge. It consists of two spans of 455 feet each, supported in the middle by a pier of wonderful dimensions. The writer of the article on Bridges in the ninth edition of the *Encyclopædia Britannica* states, that in general men cannot be got to work with safety at a greater depth than will correspond to the pressure of two atmospheres, or a depth under water of 65 feet. But by the use of the “air-bell,” or lock, Brunel was enabled to sink the foundation for this pier at a depth of $87\frac{1}{2}$ feet below high-water. In the centre of the gigantic tube or caisson on which the air-bell was wrought, the bed of the Tamar was dug out till the granite was reached, and a mass of masonry, 35 feet in diameter and 95 feet high, was constructed within the coffer-dam. This height brings the pier above high-watermark, and then there are built up four enormous iron pillars,

10 feet in diameter, bound together with lattice-bracing. The bridge itself consists of two bowstring arches, the bow consisting of a tube, elliptical in form, and 12 feet high, from which the roadway is suspended by rods or bars of iron. The height of this structure, from the base upon the rock to the crown of the bowstring arch, measures 260 feet. This, taken together with the great span of the two arches, makes Brunel's bridge of noble and gigantic proportions; and while the spans are only five feet less than those of Stephenson's bridge over the Menai Straits, this structure, from its lighter and opener appearance, strikes the beholder with even more wonder than the other bridge, finished ten years before.

The wooden viaduct by which Truro is approached is also an extraordinary work, the train passing over it high above the steeple of St. Mary's church; and, as seen from the town, the train appears to have only the slenderest possible support. The viaduct is, however, most solid in its construction, and its substitution by iron would no doubt be very expensive.

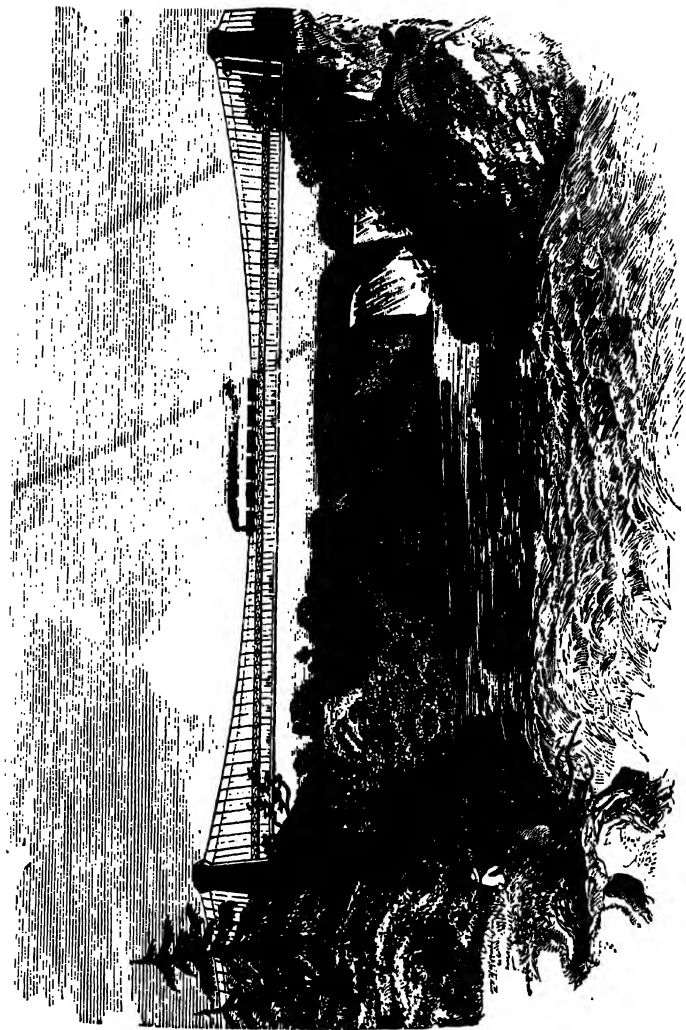
THE NIAGARA SUSPENSION BRIDGE.

Occupying, like the Chepstow bridge, a middle position between the two bridges at the Menai Straits, inasmuch as it combines, in some degree, the principles of both, but far excelling Brunel's bridge in other respects, is the

railway bridge over the rapids of the Niagara river, a short distance below the famous Falls. This bridge, completed in 1853, and designed by Mr. Roebling, consists of a tube construction, not of "continuous plates" as in the Britannia Bridge, but of lattice-work, in the inside of which tube is provided a road for ordinary traffic, while on the top the railway lines are laid. The tube, which is 800 feet long, is supported, on the suspension principle, by four enormous wire ropes, each 10 inches in diameter, and containing about 14,560 strands of fine steel wire. A great part of this bridge is of wood; and, nineteen years after it had been opened, the process of renovation was begun. The whole of the wood-work was removed and replaced, about 300,000 feet of timber being consumed in the operation, and without the traffic being in any case interfered with.

THE VICTORIA BRIDGE, ST. LAWRENCE.

Railway works grow in magnitude as time rolls on; but though the tubular bridge built over the St. Lawrence by Robert Stephenson is excelled in some particulars by bridges subsequently designed, it still ranks as one of the engineering feats of the period. The passage of a river, wide, strong, and stormy, and in winter blocked with ice, called for special boldness and skill in treatment, and the success of the bridge



NIAGARA SUSPENSION BRIDGE.

showed the younger Stephenson to be possessed of those qualities in no ordinary degree. This bridge consists of twenty-fivespans, the piers for which rise sixty feet out of the river, and, with one exception, the spaces between the piers are 242 feet, the centre span being 330 feet. The ice-force exerted against this great bridge in winter called for two special provisions—firstly, that the blocks of stone used should be of great size and weight; and, secondly, that the piers should be furnished, on the side facing the flow of the river, with a strong sharp cut-water or bow, against which the masses of ice would be broken, or from which they would readily slide off. The bridge was first proposed in 1846, but Stephenson's visit to Canada, for the purpose of inspecting the ground, did not take place till 1853. In six years' time the enormous structure was completed, a train being run through the tube in December 1859. The bridge, the iron for which was prepared in Britain, and sent out, with each piece marked to show its proper site, contains upwards of ten thousand tons of iron, and there were a million and a half of rivets used in building the plates of iron into a hollow square tube. There were about 2,713,095 cubic feet of masonry in the bridge, the stones generally being seven tons each in weight, some being larger, and the whole banded together by strong iron rivets to enable it to stand the tremendous

pressure of ice to which it is exposed.

Grand as this work is, it is expected shortly to be eclipsed by the "Royal Albert Bridge," designed by Mr. Legge, to cross the St. Lawrence lower down than the Victoria Bridge. While the latter is 7000 feet long, the new bridge is to be 15,500 feet in length. The Victoria Bridge is 60 feet above the water, but the Royal Albert is to be 130 feet high. The former, a mile long, has twenty-five spans; while the latter, nearly three miles long, will have sixty spans, ranging from 200 feet to 600 feet. The cost of this marvel of engineering is estimated at £800,000.

THE MONT CENIS TUNNEL.

The great barrier which the Alps present to free communication between northern Europe and the countries of the Mediterranean is so complete that from Genoa to the Brenner pass—a distance of 500 miles—there is nowhere any break in the chain admitting of a road at a lower level than 6000 feet above the sea.

In 1803 Napoleon I. commenced a practicable carriage-way over the Mont Cenis pass, which was completed in 1810, at a cost of £310,000. It was carried up the mountain side by six zigzags, each three-quarters of a mile in length, with a slope of about one foot in twelve. A number of stations or houses of refuge were placed at short intervals for the

shelter of travellers unable to proceed owing to the weather, and several covered ways or short tunnels were made, to defend the road against avalanches, often extremely dangerous in spring, at the time of the melting of the winter snows.

An ingenious plan for a mountain railway was introduced some years ago across this pass by Mr. Fell, having the rails laid on part of the old carriage road. It consisted of the ordinary two rails, and a third, held at some distance above the ground, between these two. This third rail was clasped by two wheels, serving as brakes when required, or assisting to drag the engine up the very steep incline. The average speed of this railway was about ten miles an hour; but the engine was small, and only capable of drawing two diminutive passenger carriages.

The proposal of a tunnel through the Alps was first mooted in 1832, and afterwards a site was selected for it where the crest of the Alps could be pierced at a manageable level, and where the distance to be bored through, though very great compared with any other tunnel before attempted, was not hopelessly beyond the means for carrying out works of the kind. This site runs almost under Mont Fréjus, the Grand Vallon, and the Col de la Rue, and nearly midway between Mont Cenis and Mont Tabor, two of the loftiest summits of the group of Alps to which they belong. The name generally given

to the Mont Cenis Tunnel is thus to some extent erroneous.

It is difficult for those who have not visited the spot to realise the boldness of the undertaking, but the following may perhaps assist such persons to form some conception of the difficulties to be overcome. Two valleys, situated nearly eight miles apart in a direct line, are separated by a range of rugged and almost inaccessible mountains, rising to some 10,000 feet above the level of the sea. These mountains are composed almost entirely of hard schist, quartz, and compact limestone; and they rise so steeply that the idea of forming intermediate shafts on the line of the proposed tunnel could not be entertained. The problem was, therefore, to bore right through these mountains for a distance of more than seven and a half miles; and thus some idea may be gained of the boldness which could project such a work, and the energy, perseverance, and skill, which brought it to a triumphant conclusion.

In August 1857 the first blast, on the Italian side of the tunnel, was fired by Victor Emmanuel; and, in the two following years, the necessary accessory works were prepared under the direction of the Government of Turin. In 1861 experiments were commenced with excavating machinery, all the work having been performed by hand labour up till that time. After many trials and failures, the boring machines got fairly to work; and from the 25th of January 1863 until 25th December

1870, when an opening between the two portions of the work was completed, they were in constant use at both ends of the tunnel. These boring machines were used, however, merely for the forming of the advanced heading, which was about seven feet square,—the enlargement of this heading to the full section of the tunnel being performed by hand labour.

The tunnel is constructed in a straight line from Fourneaux, a village in the valley of the Arc about one and a half miles from Modane, on the French side, to Bardonnèche, on the Italian side of the mountain, the total distance traversed being about seven miles and 1020 yards. At Bardonnèche the nature of the ground did not allow of the tunnel being conveniently commenced at a less elevation than 4344 feet above the sea; while at Fourneaux the entrance has been made at a point 3904 feet above the same level,—a difference of 440 feet. It having been expected that during the execution of the work a considerable quantity of water would be met with, it was determined to construct the tunnel with a rising gradient of one in 2000 from the Bardonnèche end, this gradient being met near the middle of the tunnel by a gradient of about one foot in 45, rising from Fourneaux. The fall towards the Italian end was intended to give drainage to the works in the event of an influx of water taking place; but no such event occurred, and the tunnel might have been as readily con-

structed with a uniform gradient from the southern to the northern side. The materials traversed by the tunnel were schist, quartz, and compact limestone; and the points at which the various strata have been found to commence and terminate, agreed very closely with the positions assigned to them by the geological surveyors. Commencing from the French end, the schist was found to extend for a distance of 2346 yards, and this was bored through at the average rate of rather more than four feet per day, a small portion of this length having been excavated by hand labour alone. Next to the schist came 550 yards of quartz, which was traversed at the rate of scarcely two feet per day; and this was followed by the compact limestone, in which the work on the French side was carried on at the rate of about six feet ten inches per day,—a rate far greater than was at first anticipated. Between the point where the limestone terminates and Bardonnèche nothing but schist was met with. The workings from the Italian end were schist only, and were carried on at the rate of a little over five feet per day. The total number of workmen employed was about three thousand—one thousand five hundred at each end of the tunnel. These were divided into shifts or gangs, working from six to eight hours a day, according to the character of the work, and operations were carried on night and day with the utmost regularity.

At the French end the tunnel

is 26 feet $2\frac{3}{4}$ inches wide at the broadest part ; 25 feet $3\frac{1}{2}$ inches wide at the base ; and 24 feet $7\frac{1}{4}$ inches in height, the arch being in the form of a semicircle. At the

Bardonnèche end the tunnel is made elliptical to resist the pressure caused by the inclination of the strata, and the height of the tunnel is increased to 25 feet 7



inches. For some distance from the entrance the tunnel is lined with stone masonry ; and at some of the interior portions, where it is necessary to keep up the materials, a lining is used of brick ; but where

the rock is good and sound, no lining is required. The work of drilling the headings of the tunnel was performed by means of machine drills, operated by compressed air, — an improvement by the Sar-

inian engineers, MM. Grattoni, Grandis, and Sonmeiller, upon other machines previously patented in Belgium, Piedmont, and England,—M. Colladon of Geneva having been the first to substitute air for steam.

It was found, in practice, that the compressed air used to work the drills, although conducted, during the progress of the work, for from two to four miles through the iron pipes before acting on the pistons of the drills, lost but little of its pressure. The initial pressure being six atmospheres, or ninety pounds per square inch, the pressure at the drills was usually about three pounds less, or eighty-seven pounds.

The machines penetrated the rock, not by drilling, but by the blows of a chisel turning slightly on its axis at every blow. They were driven to an average depth of $2\frac{1}{2}$ feet, which was accomplished in less than an hour. After many holes had thus been bored, the machine was withdrawn and the holes were charged with powder and blasted. By this means the cavity was enlarged, and it was then walled and arched in the usual way. The same compressed air which worked the machines, most effectually ventilated the tunnel. It also cooled it by absorbing heat during its escape from a compression of six atmospheres.

The boring of this great tunnel has afforded some interesting facts which were unexpected by geologists. Professor Ansted, who

carefully watched the progress of the works, thus states the belief previously current:—"That mountain chains might be regarded as the skeleton or bony framework of the earth; that granitic rock was the nucleus of the earth, and therefore would be found forming the central mass and axis of all mountains; that great convulsions had accompanied the elevation of mountain chains; that there was a complete system of circulation of water through rocks in the interior of the earth; and that, as in most cases observed, the temperature of the interior of the earth increases at the rate of one degree Fahrenheit for every fifty or sixty feet, there would be serious difficulty felt in cooling and ventilating any work carried on so far in the earth's interior as the centre of a tunnel like the present."

In practice, however, it was found that in place of there being a core of granite in the crest of the mighty Alps, there was not even any rock indicated exhibiting more alteration than is common in most of the older series of strata found everywhere in Europe. Neither was there any appearance of dislocation. All the indications of the enormous force that must have been needed to elevate the mass into its present position consisted of a very few slight instances of the sliding of the rocks on each other for a short distance, leaving polished surfaces. It was also found that the quantity of water met with in the boring—so much dreaded—was hardly worth men-

tion, and at no time checked the progress of the work. The temperature was nearly steady at 80 degrees.

By the completion of this tunnel a journey of about twenty minutes carries the traveller through the Alps, and the railways of France are by it united to those of Italy, while a continuous communication, without break of gauge, is established between Calais on the English Channel, and Brindisi on the Mediterranean Sea, a distance of 1390 miles. When we consider the growing importance of the latter port as a point of departure for the eastern mail steamers, the value of such a system of European communication can scarcely be overrated.

The cost of the Mont Cenis Tunnel was close upon three millions sterling.

The St. Gothard Tunnel, now (1877) in course of construction, and expected to be completed in 1879, will be of even greater magnitude than that now described. It was projected to connect the Swiss railways with those of upper Italy in the valley of the Ticino. Its section is the same as that through the Col de Fréjus, but it is upwards of a mile longer. This tunnel has been under construction since 1872.

THE CHANNEL TUNNEL.

All works of the nature of a tunnel promise to be overshadowed by the projected tunnel under the English Channel, from St. Mar-

garet's Bay, South Foreland, to a point midway between Calais and Sangatte. It has long been asserted by geologists that at one time England was connected with France by land, forming a peninsula; and the separation seems to have been effected by the slow and long-continued action of the sea.

About the year 1872, an association of capitalists and scientific men was formed to carry into effect, if possible, this long contemplated scheme. The proposal for a tunnel to connect the two countries is, however, one long anterior to the rise of the railway system. Such a project was discussed between Napoleon, when First Consul, and Charles Fox, after the Peace of Amiens; and at one interview it is recorded that Napoleon remarked to Fox, "Oh, c'est une des grandes choses que nous pourrions ensemble!" It has remained for a period nearly three quarters of a century later than that declaration to show a union of French and British savans and financiers resolving to unite and accomplish it. The Channel Tunnel remained dormant for a long time, and to M. Thomé de Gamond pertains the credit of having persistently advocated the project for thirty years before it finally took shape. M. Thomé de Gamond was not quite so far ahead of his time as Napoleon, chronologically speaking; but as the practical man whose proposals have really formed the groundwork of nearly every scheme for carrying the idea into

effect, he deserves to be remembered. There is probably little doubt that the success of the Mont Cenis Tunnel, and the constantly growing demand for speedier and fuller access to the Continent, wrought together to bring the question to a bearing in 1875. On the British side was found Sir John Hawkshaw, and on the French M. A. Lavalle, who took the subject seriously in hand, and on the 2d August 1875 a *projet de loi* was framed by the National Assembly of France, and the President of the Republic (Marshal Macmahon) granted a concession on the 5th of the same month, with full powers for the construction of a submarine tunnel between England and France.

The first act was the appointment of a geological committee to ascertain the course of the south boundary of the chalk stratum through which, as proposed by Sir John Hawkshaw, and already surveyed by him, the tunnel would be bored. This stratum forms the northern boundary of the Bas Boulonnais, disappearing into the sea at Wissant, and reappearing, with only a slight deviation, to the north of Folkestone. As it was concluded by geologists that if the edge of the stratum was regular, its body would also probably be regular, the attention of the commission was first directed to the ascertainment of the condition of the edge of the stratum. The result of a series of careful observations made in 1875 was to show that no break exists in that portion

of the layer of chalk, gault, and *craie de Rouen* which comes to the surface on the bottom of the Channel in the parts where the soundings were taken. These soundings, and other operations taken subsequently, point to the probable success of the great work.

In the execution of this tunnel it is proposed that a driftway nine feet in diameter should first be carried through the bed of chalk which stretches across the Channel, and that this should afterwards be enlarged to the full size of the tunnel.

The distance across the Channel at the point selected is about 22 miles; but as considerable approaches would be necessary on either side in order to reach the level of the tunnel entrance, the entire scheme will embrace about 31 miles of railway.

In the first instance, shafts would be sunk on each shore to the depth of 450 feet below high-water mark, and from the bottom driftways would be driven for the drainage of the works whilst in progress, and for its permanent drainage after completion. A tunnelling machinery, suited to the gray chalk, has been invented by Mr. Dickinson Brunton, which works like an auger boring a hole in wood, and can make a driftway seven feet in diameter at the rate of a yard and a quarter per hour. At this rate it would only require two years to drive a passage from one side of the Channel to the other, a machine being started from each side.

The greatest depth of water of the sea above the tunnel is only 180 feet; and it is expected that there will be at least 50 yards of chalk between the sea water and the crown of the arch of the tunnel.

As the actual tunnel will, it is proposed, run from St. Margaret's Bay, a little to the east of Dover, and reach France at a point somewhat to the west of Calais, between that town and the village of Sangatte, it is at these two points that the preliminary excavations will be made. The longitudinal section of the tunnel will take the form of an arch of almost imperceptible curvature; the drainage being thus conveyed to each end by gravitation, and carried through properly constructed culverts to wells at convenient inland points, from which it will be pumped to the surface. On quitting the bed of the sea, the tunnel itself will rise by an easy gradient to the surface at some distance from the coast, and junctions will be effected with existing lines of railway on either side.

According to Sir John Hawkshaw, the tunnel will take ten years to construct, and cost ten millions sterling. A rival pro-

posal for accelerating our traffic with the Continent, is that of laying a pair of huge tubes along the bed of the sea from Dover to Cape Griznez, which would involve an outlay of twenty-two millions sterling, but it is supposed that the tubes could be laid and the Channel railway completed in five years.

Should either of these great schemes be successfully carried out, the commercial advantages would be beyond all calculation. A link between the two chief capitals of western Europe, which should annex our railway system to the whole of the railways of the Continent, would practically widen the world to pleasure and travel and every kind of enterprise. The 300,000 travellers who cross the Channel every year would probably become three millions, if the sea were taken out of the way by a quick and safe communication under it. The journey to Paris would be very little more than that from London to Liverpool. In short, the Channel Tunnel would be the crowning enterprise of an age of vast engineering works.

To show the comparative cost of tunnelling operations, the following information may be quoted:—

		Cost per Lineal Yard.
Mont Cenis	length 7.60 miles	£167 12 0
Kilsby (London and North-Western)	„ 2398 yards	125 0 0
Watford Do.	„ 1791 „	80 0 0
Salkwood (South-Eastern)	„ 954 „	118 0 0
Bletchingley Do.	„ 1324 „	72 0 0
Buckhorn (Salisbury and Yeovil)	„ 739 „	72 0 0
Thames Tunnel (East London)	„ 400 „	1137 0 0

Fuller information on this subject may be sought for in Simm's *Practical Tunnelling*.

TRESTLE BRIDGES IN AMERICA.

The abundant and convenient supply of timber in America has given rise to a class of railway works there, such as are now rarely seen in any form in this country, and never in the style peculiar to the railways of America. The same country which is content to live in "frame" houses, to travel over "corduroy" roads, and otherwise to utilise its "lumber" in the earlier stages of the progress of a district, was not slow to perceive the advantages, as regards rapidity and cheapness of construction, of wooden railway bridges and viaducts. Over miles upon miles of swampy ground railways are carried upon trestles, and travellers are fain to allege that though such roadways are not to be compared as regards the feeling of safety with our embankments and stone or iron bridges, yet they have certain attractions, as in the softness and springiness of the motion, and the picturesque effects they often produce in the landscape. When a great mountain ravine or a rocky "gulch" is encountered, the railway may be seen carried over such a bridge as that represented in our illustration, in which the features common to those interesting structures are well shown.

The largest and grandest work of this kind was the Portage Bridge carrying the Buffalo and

Hornellsville branch of the Erie Railway over the Genesee river in the State of New York. The gorge spanned by this grand work had walls almost perpendicular, and in the bed the river leapt by three distinct falls to the lower valley. The bridge stood upon thirteen massive stone piers, standing well out of the water, to secure the bridge from damage by the floods to which the river was liable. The frame part of the bridge was 800 feet long, and rose above the stone piers to a height of 234 feet, and the structure showed the same peculiarity as was claimed by Brunel for his wooden bridges in South Devon, that any timber could be removed and replaced without endangering the bridge, the maintenance of the bridge by gradual renovation being thus secured. This great pile of timber, of which an illustration is given in the new edition of the *Encyclopædia Britannica*, cost 175,000 dollars, or £35,000. One great risk to which wooden structures are exposed was shown in the fate of this elegant structure, which was burned down in the year 1875. A train, it is stated, had just passed over the bridge when the fire was discovered, and every effort to extinguish it was unavailing. The construction of those trestle bridges over frightful chasms may be said to have added a new terror to travelling on the part of those unused to them.

THE TAY BRIDGE.

We proceed now to describe a



AN AMERICAN 'TREESTLE' BRIDGE.

bridge in Scotland finished contemporaneously with the publication of this work, and which, while in many respects competing with even the Britannia Bridge, in point of scientific interest, presents to the outward eye nearly the antipodes of that famous structure.

It is not necessary to do more than notice here that the art of iron bridge making, like many other branches of engineering, has been rapidly progressive. The observation that a hollow rod was stronger than a solid of the same diameter found its practical exemplification in the solid sides, top, and floor of Stephenson's bridge over the Menai Straits, and other works of later construction in which the same principle was applied. The "continuous plate girder," however, may be now held as fairly driven from the field, for all ordinary purposes, by the "lattice girder," in which (stating the matter roughly and without pretence to scientific accuracy) the strength of the tube is obtained without its weight or cost. One of the earliest important lattice girder bridges is that known as the Crumlin viaduct, carrying the Taff Vale extension railway, and consisting of ten spans of 150 feet each, carried to a height of 200 feet over the bed of the river, or 75 feet higher than the Britannia Bridge, and only as yet exceeded in height by the Niagara Bridge. The Crumlin viaduct has the peculiarity of being made of iron throughout, the piers being in

clusters of cast-iron pillars, united by "lattice bracing." The difference in cost between the two bridges named may be in no inconsiderable degree owing to the conditions under which the Britannia Bridge was erected, but it is a noteworthy fact that the latter cost £398 "per foot forward," while the bridge at Crumlin only cost £21 per foot.

The Tay Bridge, of which we now proceed to speak, presents many points to rivet attention. It is not only the longest iron bridge in existence, and the longest bridge standing in running water, but it is the only bridge standing in a navigable estuary, subject to ebb and flow of the tide, to the concentrated wind storms of a neighbouring mountainous region, and to the unbroken fury of gales direct from the sea. It has excited the admiration and enthusiasm of all who have watched its progress, or studied the varied engineering points illustrated in the course of its construction. Stretching like a mere thread—it is but for a single line of rails—over a channel more than two miles wide, it seems, even from a short distance, to be a mere film, a spider-like web which a morning's breath would brush away. Viewed near at hand, whether from the giddy summit of its pillars or while sailing under its lofty girders, it is seen to be a work of great massiveness in many of its parts, and to present features of interest which fully repay closer investigation.

A versatile and accomplished journalist, who thus expressed himself after an inspection of the Tay Bridge works, explains the object for which this gigantic work has been undertaken, and shows the reasons which may yet lead to the more gigantic "Forth Bridge" being also constructed:—

"The world hears in these days much about schemes for tunnelling the Channel. Dismiss the notion. Crossing the sea in that way is beneath the dignity of humanity—is an engineering subterfuge. We declare for truth and daylight. A tunnel is suggestive of an 'underneath' proceeding. If Englishmen must visit their polite neighbours, let them do so openly and above board, and not crawl in like a burglar through a cellar grating, or like a rat popping up from a dry sewer. The way to cross a sea may be seen in Scotland, where Dutch contractors and engineers¹—an amphibious race—working to the plans of Mr. Bouch, are hanging a bridge in mid-air over some two miles of salt water. Talk of difficulties!—of impossibilities! Bah! The 'impossible' is fast being performed. Here, over the Firth of Tay, between opposing ranges of hills, above shifting sandbanks whereon cross-tides wrangle and

fight together, a bridge is half completed. Now the valley of the Tay is a funnel through which Boreas blows his lustiest blast, and the water of the Tay is of the nature of the Highlander, *thrawart*, fierce, and easily provoked. You see the watery plain at early morn blue and calm as a cloudless sky—so pellucid that the slippery rocks, the trailing seaweed, the patches of parti-coloured marine mosses, shine through its glassy shallows. Seen in this mood it is tranquil as sleep, fair as a child's dream, and all the wooded knolls and all the corn-clad 'braes' are glassed in its waters. You see the same Firth an hour or two later when the wind has swept down from the west, meeting the strong sea tide, and, behold! the trees are bending like bulrushes, and the watery plain is all—'white horses.' And it is here, in this place of storms—here, close by the spot where a stately two-decker, the *Mars*, lies moored, stem and stern, to massive anchors, that men are engaged completing the line of bridge piers which is destined to hold up a railroad reaching from Invergowrie on the one side to a jutting hill on the other.

"In a work of this kind figures fail to prefigure its greatness. Their very affectation of definiteness conveys only a hazily indefinite idea of the reality. He who would realise how vast a thing it is must sail or steam under it, and see close by him the huge gasometer-like vessels of iron which are floated out to be filled with con-

¹ This is an error, so far as regards the contractors, who were first, De Bergue and Company of London, and are now Hopkins, Gilkes, and Company of Middlesborough. The practical engineer of the bridge, Mr. Albert Grothe, is a Dutchman; as are also some of his assistants.

crete and sunk in the sand under water, where hardy men are working unseen like so many coral insects. It is from the water that the skill of the designers and artificers is best appreciated. Here a wedge-ended structure of brick, held securely together by cement, is being floated out to its destination, where it will have to bear for long years the chafing of the tide and the grinding of winter ice. Yonder the sand pumps, specially invented to meet the exigencies of this work, are sucking big cavities in the sandbank. To the right and the left stand long lines of piers, carried up to the full height of 88 feet above high-water mark, and on these enormous structures rest the great girders which are to carry the railway, and the iron lattice work that stiffens and stays the girders. There is one procession of piers striding far out from the Dundee side, there is another walking out from the south, and there is a detached row in the middle waiting to shake hands some time hence with the lines that are wading towards it from the north and from the south. Fourteen of the spans between the piers will be of 200 feet, and of sufficient height to allow the steamers, the schooners, and the brigs, which trade to and from Newburgh and Perth, to pass under the line. Undertakings of a character so ambitious are invariably attended with danger to life and limb. One day an air-bell blew up and drowned six of the courageous fellows who were

at work below the tide. At another time two or three of the piers canted over a little, and had to be blown up piecemeal with dynamite. It speaks well for the forethought of the engineers and contractors that a task so tremendous as theirs has not been attended with greater loss, and the more so as the valley of the Tay has of late years been swept by storms of abnormal severity.

“Scotland presents a tough problem for railway engineers intent upon establishing direct lines. Hitherto they have had to outflank two wild and boisterous inland seas by taking their railways round them—a horse-shoe shaped detour, provoking to impatient travellers. There are, of course, steam-ferries and powerful passage-boats at the ferries, but practically the loss of time in transshipment and ferrying over two sea-gates has made the circumlocutious lines the quickest in point of time—an experience detrimental in the first degree to the North British, and in the next degree to the North-Eastern and the Great Northern. On this (the south) side of Edinburgh the traveller has all that he can desire, and perhaps a little more than cautious men do desire, in the way of speed. The present writer did the whole distance between York and Edinburgh in four hours and a half. One Goliath of an engine, with a driving-wheel of extraordinary size, and a general look of almost truculent determination, flew off with our heavy train at that pace.

How the telegraph poles slid past in the twilight, and how the 'flying Scotchman' slid through all its snaky length as the fiery dragon in front devoured the ground—now thundering through a cutting, now flashing past a south-going train, now causing the little stations by the way to close up as they vanished like scudding cloud-lets in the trailing steam. There was something like menace in the deportment of our iron dragon—menace in its saucy, surly snorts, and moody defiance in the breath of its nostrils. It seemed as if the arch-fiend had got hold of the train, and was tearing away with it through the slitting air. But our dragon had another manner when he walked into Edinburgh. There he glided over the metals in his gentlest mode, slow, stately, self-possessed, and devoid of fuss, as if he had walked the whole distance in four hours and thirty minutes, and as if he could have done it in half the time, supposing he had chosen to be in a hurry. But as Edinburgh is the broad seagap where travellers, once on a time, were detained for a whole week together, this also is to be bridged by and by with a bridge that will stride from height to height high across the steel-grey brine beneath. The time will come when the East Coast route will be shortened by two hours, and when the canny Arbroathians, Dundonians, and Aberdonians, will wonder at the slow old times when travellers going south from the east coast towns beyond the Tay

had to strike across the country and catch a gleam of the Irish Channel on the right hand, while on their way to the great city whose wharves are laved in the tide sent up from the North Sea. The Tay Bridge will form the first of the two links in point of precedence. It is growing steadily and surely. At dead low water the wide shallows of the Tay are dotted with the massive foundations laid for new piers, and with these ready for the workers above water, the task of erecting the superstructure will be easy. The view of the bridge will be one of great extent and of some natural beauty. On the south lies Newport, embayed in woods, its rocky knolls crested with villas, its upper slopes adorned with stately mansions. On the west is the castled crag of Kinnoull. On the east lies the sickle-shaped bay of Broughty, with an old fortress standing sentry by the narrow gate of the outer sea. On the north lies Juteopolis, rich, ambitious, and not unmindful of her old name, *Donum Dei*, and behind Dundee is the volcanic hill known as 'The Law,' and behind the Law the billowy Sidlaws, and beyond the Sidlaws the cloudy and cloudlike tumult of the Grampians—three ranges, standing 'line above line, terrace o'er terrace, nearer still and nearer to the blue heavens.' He who is in haste to escape from the smoke of South Yorkshire, and breathe the air of the Forfarshire Highlands, may wish to know to whom he is

mainly indebted for the pathway in the air that is now being made for him. The engineer is Mr. Bouch, the resident engineer is Mr. Patterson. The engineer for the present, as well as for the original contractors, is Mr. Grothe, the distinguished son of Professor Grothe of Delft. And Mr. Grothe is in his turn supported by a group of remarkably able gentlemen, whose inventive resources and whose professional enthusiasm have proved of great value to their chief, and whose place in the esteem of the local residents is only second to his own."

Our space will not permit that we should do more than describe a few of the more important or remarkable railway works besides those already named. All over the world, however, there are gigantic structures and elaborate works which merit attention. In India, for example, the exigencies of great river floods have given rise to many bridges which are marvels of bold and ingenious engineering, while such a work as the Bhoze Ghaut Incline also presents features to be remarked. This work consists of a gradient averaging one in forty over an extent of fourteen miles, with numerous tunnels and viaducts, one of the latter being of immense height above the ravine skirted by the line. In Spain the bridge over the Ebro consists of 21 large spans of lattice girder work, resting on iron cylindrical piers, with rock foundation in the bed of the river. The line over the Canta-

brian mountains, connecting Santander with Madrid, offered serious practical difficulties to Mr. Vignolles, an English engineer, who carried the line over the chain of mountains at an elevation of more than 3000 feet above the sea. As regards the railways in Spain, of which a good deal was heard during the latest Carlist campaign, it may be noted that Mr. Ford, in his charming "Handbook," predicts that the muleteer will not be so easily driven from his means of living as men have been in other countries. "He, the *arraiero*, constitutes one of the most numerous and finest classes in Spain. He is the legitimate Manuel of the semi-oriental caravan system, and will never permit the bread to be taken out of his mouth by the Lutheran locomotive; deprived of the means of earning his livelihood, he, like the smuggler, will take to the road in another line, and both will become either robbers or patriots. Many, long, and lonely are the leagues which separate town from town in the wide deserts of thinly-peopled Spain, nor will any preventive services be sufficient against the *guerilla* that will then be waged. A handful of opponents in any cistus-overgrown waste, may at any time, in five minutes, break up the road, stop the train, rob the stoker, and burn the engines in their own fire, particularly smashing the luggage train." How much more fully than even Mr. Ford thus playfully suggested the work of interrupting trains has been

carried on in Spain, the readers of newspapers within the past few years will know.

In Germany one of the great railway works is the bridge over the Rhine at Cologne, where the road and the rail are carried across together, superseding the famed bridge of boats, the bridge being five years in course of construction and costing £600,000. Its peculiarity is that the road bridge and the rail bridge, though resting on the same piers, are practically distinct bridges, the former having a carriage way and two footpaths, and the latter containing a double line of rails. In Holland, the most remarkable railway work is the bridge over the Hollandsch Diep, near Moerdijk. The water is here one mile five furlongs in length, but by means of stone piers thrown forward into the bed, the bridge is reduced to a length of seven furlongs. There are in all 14 spans of 330 feet each, resting on stone piers 50 feet wide and 10 feet in thickness. The foundations were laid on the pneumatic system, on much the same principle as that adopted for some parts of the Tay Bridge works, and three of the foundations at the south end of the bridge are sunk to a depth of from 50 to 60 feet below the surface of the water at

low tide. About 1200 tons of iron were used in the bridge, which is on the lattice girder principle, and the cost of the work was about £460,000. A train takes between four and five minutes to cross the bridge, no great speed being allowed. The erection of the bridge was begun in May 1868, and finished in November 1871.

The Sömmering Railway, opened in 1854, and connecting Vienna with Trieste, presents between Glognitz and Mürzzuschlag some extraordinary works in steep gradients, tunnels, and viaducts; and as the train runs down steep declivities and close to the brink of tremendous precipices, it claims to be one of the most terror-striking lines in the world.

In the construction of the "Intercolonial Railway" in the Dominion of Canada, a number of large bridges of remarkable form have been built, showing lattice and truss girders in nearly every variety. In the piers provision is made to resist both the pressure down stream of an "ice-jam" in the rivers, and the upward strain on the mason work through the piled-up ice pressing against the lower surface of the girders, the stone-built piers being "joggled" with that view.



CHAPTER IV.

Thou hast to those in populous city pent
Glimpses of wild and beauteous nature lent,
A bright remembrance ne'er to be destroyed.

Joanna Baillie.

SPREAD OF THE RAILWAY SYSTEM—GROWTH IN THE UNITED KINGDOM
—TRAFFIC AND REVENUE—RAILWAYS IN THE BRITISH EMPIRE—
RAILWAYS IN INDIA—A RAILWAY TO INDIA—RAILWAYS IN CANADA
—THE RAILWAYS OF THE WORLD—RAILWAYS IN THE FAR EAST.

SPREAD OF THE RAILWAY SYSTEM.

IN adapting to the railway system the words of Joanna Baillie, prefaced to this chapter, some liberty is undoubtedly taken with the idea that learned lady had in her mind when she penned her lines on Wordsworth. Yet what Wordsworth did in imagination for his readers, when he sang of nature to those "in populous city pent," and sang with a voice new and fresh as nature itself, that has the railway done in fact. It is not too much to aver that the growth of the railway system has effected a social revolution, slowly but surely, affecting the mode of life of many, and in a great degree changing the character of our towns. In the olden times, when men huddled together for defence and mutual protection, the cities showed narrow streets and contracted sites, and there was a sharp line of demarcation between the urban and the "landward" resi-

dent, a country life being as distasteful as it was inaccessible to our merchants and traders. How much this is changed we need hardly say. The crowded trains, which disgorge their hundreds and thousands of merchants, clerks, shopmen, and even labouring men and women, upon the stations of London or Glasgow, tell how extensive is the practice of living out of town; and the complete desertion of the business streets of the metropolis after a stated hour in the evening, tells how completely the railway system has rendered possible the divorcement of places of work and places of residence. Not less remarkable in the connection now referred to is the growth of public holidays, the establishment of tourist and excursion facilities, and the multiplication of means by which glimpses of the grace and beauty of nature have been made possible

to all who have the power to enjoy it, or, what is as much to the point, the desire to cultivate the power to enjoy it. Without burdening these pages with statistics, some figures illustrative of the growth of the railway systems of the world may be given, in order that a definite idea of the greatness of this social engine may be realised.

GROWTH IN THE UNITED KINGDOM.

Believing that the principal part of the revenue would be derived from the conveyance of heavy goods, the promoters of the Liverpool and Manchester line estimated the receipts from passengers at £20,000 a year only; but only the experience of a few weeks was necessary to prove that from passengers a very large part of their revenue would be derived. In the three and a half months to the end of 1830, upwards of 71,000 passengers were carried upon the railway. Thus, by a very short experience, the original idea as to railways was superseded, and the value of the system in promoting the personal convenience and intercourse of the people was recognised. The growth of the goods traffic, though slower by comparison, was also great. There was a reason for the slowness of the growth of this traffic, so far at least as concerned the first railway. On this point Dr. Lardner says, "If the traffic in passengers exceeded all

anticipation, the transport of goods, on the contrary, fell short of what was expected. The canal lowered its tariff to the level of the railway charges, and increased its speed and its attention to customers. The canal, moreover, winding through Manchester, washed the walls of the warehouses of the merchants and manufacturers. At the other end it communicated directly with the Liverpool docks. The goods were therefore received directly from the ship, and delivered directly to the warehouse, or *vice versa*, without the cost, delay, and inconvenience of intermediate transshipment and cartage." Notwithstanding these difficulties, the goods traffic of the Liverpool and Manchester line soon reached 1000 tons a day; and no one who is familiar with the dock and shipping arrangements of railways in our own day, and who has witnessed the enormous growth of the goods revenue, can fail to see that the first disappointment with reference to goods traffic arose because suitable arrangements had not been made to accommodate it. The figures now to be given will perhaps, better than any argument, testify to the remarkable growth of the railway system, and its development of goods traffic. It is a very general opinion, but an erroneous one, that the second twenty years of railway history have done less than the first twenty, and that the greatest development of railways immediately followed the "mania" of 1845 and subse-

quent years. The fact is, however, that as large an addition to the mileage in the United Kingdom has been made since 1855 as before that time, as the following figures will show :—

RAILWAYS IN GREAT BRITAIN AND IRELAND.

	<i>Double Line.</i>	<i>Single Line.</i>	<i>Total.</i>
1836	450	...	450
1843	2,036	...	2,036
1855	6,153	2,182	8,335
1875	8,898	7,760	16,658

From 1825 to 1850 the rate of railway construction showed an average of 265 miles per annum ; from 1850 to 1860, an average of 381 miles per annum were constructed ; and from 1860 to the end of 1875, the rate was 415 miles per annum. In the table showing the mileage of railway line per square mile of territory, prefixed to Mr. Frederick Martin's *Statesman's Year Book*, the United Kingdom stands second, the ratio being one mile of line for seven square miles. Belgium, as we shall subsequently show, stands first, its ratio being one in five.

In Captain Tyler's report, from which some of the preceding figures have been drawn, there is a list given of triple lines and quadruple lines existing in places where the traffic has outgrown the power of a double line to carry it ; showing 117 miles of a triple track, and 134 miles of line where there are "four or more lines of rails." This question of duplicating the railways to meet the demands of the growing traffic is one of those pressing upon railway managers

for solution. It is a curious point, worthy of special recognition, that Mr. Charles Maclaren foresaw this in 1825, the words he wrote half a century ago having a singular value at the present moment :—

"Let us suppose, for instance, that the most eligible rate of motion is found to be 8 miles an hour for goods, and 16 miles for passengers. One consequence would probably follow from this, that as carriages travelling rapidly could not easily pass one another on the same rails, every great railway would have two sets of paths—one for quick, and the other for slow vehicles ; and it might perhaps be found expedient to have these paths of different breadths, strength, and dimensions. I say two sets (that is four paths) because on all much-frequented roads one path would be required for going and another for returning for each class of vehicles." It would seem from the expressions here used that Mr. Maclaren had also foreseen the growth of single-line railways, which are of comparatively recent date, and in which the past twenty years has seen a fourfold increase, while the double lines have only increased 45 per cent in the same period. Coming to the distribution of lines in England, Scotland, and Ireland, the figures at the end of 1875 were as follows :—

	<i>Double Line.</i>	<i>Single Line.</i>	<i>Total.</i>
England & Wales	7329	4460	11,789 miles.
Scotland	1060	1661	2,721
Ireland	509	1639	2,148 "

The above lines were owned nominally by 583 separate companies, but from the large number of local lines, etc., managed under working agreement, there were only 125 companies actually engaged in conducting traffic, as we learn from Mr. D. Kinnear Clark's contribution to the series of books entitled *British Manufacturing Industries*. These companies are thus distributed:—

Companies.		Average mileage worked by each.	
England and Wales	94	124	miles.
Scotland	7	386	"
Ireland	24	88	"
United Kingdom.	<u>125</u>	<u>132</u>	"

The most extensive railway establishment in the kingdom is that of the London and North-Western Company, which had, at the end of the year 1875, the working control of the following lines:—

Single track	856	miles.
Double "	1163	"
Triple "	47	"
Four or more tracks	88	"
	<u>1604</u>	<u>miles.</u>

This one gigantic enterprise is the result of about two hundred Acts of Parliament; and when its history is to be written, the chapter on parliamentary costs will be a prominent one, as indeed in that of all our earlier railways. To construct the railways in the United Kingdom has engrossed the enormous sum of £630,223,494, or an average of £37,833 per mile, and the excessive cost of land and law in the promotion of our earlier railways

is shown by the following analysis, which we also obtain from Mr. D. Kinnear Clark's work, already quoted:—

Law and parliamentary expenses	5.5	per cent.
Land and compensation	19.5	"
Railway line and stations	50.	"
Locomotive and carrying stock	8.	"
Interest on stock contingencies	17.	"
	<u>100</u>	

The actual fabrication of the railway has therefore employed less than two-thirds of the whole capital. The case of the Great Northern Company running from London to York, and embracing 636 miles of railway, is exceptional, it being calculated that 23½ per cent of the capital was forestalled before ground was broken to make the line. In the case of the Trent Valley line, it has been remarked that the ultimate cost of constructing the whole line was probably not much more than the amount expended in obtaining permission to make it! As a contrast to this, the favourite example is that of the Peebles Railway, which was amalgamated with the North British in 1876 after a prosperous career of twenty-one years, and the entire cost of which, including law, land, and line, was £6688 per mile, being about one half of what the unfortunate Eastern Counties Company paid for land alone!

TRAFFIC AND REVENUE.

To illustrate the growth of goods traffic in this country, the

figures at the end of each period of twenty-one years since railways were opened may be given :—

	Passengers.	Goods.	Total.
1854	£10,244,954	£9,970,770	£20,215,724
1875	25,714,681	33,268,072	58,982,753

Reduced to averages, it is found that while in 1854 the relation stood thus :—

Passengers	50.68 per cent.
Goods	49.34 „

in 1875 the ratio had so far changed that we have :—

Goods	58.09 per cent
Passengers	41.91 „

The number of passengers had increased from 111 millions in 1854 to 506 millions in 1875.

It is to be noticed that in the last twenty years, and more especially since the introduction of “third class by all trains,” there has been a marked decrease in the proportion of travellers in the superior classes of carriage, the numbers in 1875 being the following :—

1st class	43,708,886 passengers	8.62 p. cent.
2d „	70,525,171	13.90 „
3d „	892,741,177	77.48 „
	<u>506,975,234</u>	

showing, in round numbers, four-fifths of the passengers to be of the “people’s class.” In 1857 the proportions were

1st class	13.4 per cent.
2d „	30.4 „
3d „	56.2 „

As regards revenue, the third class, though travelling cheaper, stood far above the other classes in the total amount paid, the passenger

receipts from various sources being thus averaged :—

1st class	18 per cent.
2d „	16.5 „
3d „	49.6 „
Season tickets	4.3 „
Excess luggage	9.0 „
Mails	2.6 „

100.

The average fare paid per passenger was in 1857, 1s. 6d.; in 1870, about 1s.; and in 1874, 10½d.; showing still more conclusively that the improvement of third-class accommodation had cheapened as well as extended the use of the railway.

RAILWAYS IN THE BRITISH EMPIRE.

Although strict historical order would take us from the United Kingdom to Belgium, or France, or the United States, as the earliest countries to adopt the railway, there may be some convenience in noticing, first, the extent to which this mode of travelling is found to exist in those vast countries in remote continents which own the sway of the British Crown. We should become unduly statistical were we to state here the area or the population of those large and numerous territories. But no better means can be devised by which the difference between the development of railways in the mother country, and in her colonies and dependencies, can be shown, than by indicating how far the mileage of completed railways bears relation to the territorial extent. We have seen that in the United Kingdom the ratio is one

mile of line in seven square miles, and it is calculated that, taking the whole British Empire, the ratio is one mile of railway in 164 square miles. There are included in this extensive lands as yet only partially settled, as in Western Australia or South Africa, which bring the ratio down; but it is perhaps worthy of remark, as indicating the vastness of that empire on which, as it is boasted, the "sun never sets," that the ratio of railway line completed to superficial area, is less over the British Empire as a whole than in Turkey or Russia in Europe, and that America, as a whole, follows very little behind the British possessions as a whole, though in the former we find one territory containing only one mile of railway to 45,461 square miles of space! The following are the details of the railway possessions of the Queen's empire.

GREAT BRITAIN.	
England and Wales	11,789
Scotland	2,721
Ireland	2,148
	— 16,658
ASIA.	
British India	6,461
Ceylon	92
	— 6,553
AMERICA.	
Dominion of Canada	4,443
Jamaica	25
British Guiana	21
	— 4,489
AFRICA.	
Cape Colony and Natal	154
Mauritius	66
	— 220
AUSTRALIA.	
New South Wales	437
Victoria	618
South Australia	258
Queensland	263
Tasmania	167
Western Australia	40
New Zealand	542
	— 2,925
Total British Empire	<u>30,245</u>

At the end of 1875, when the above totals were made up, there were, it was calculated, about 5000 miles of railway in course of construction throughout British dominions.

RAILWAYS IN INDIA.

In the above list of British railways, the lines which are of most interest, and also those which, relatively to the extent of territory, are the most fully developed, are those of British India. The statistics of the cost and financial results of those Indian railways may be found in various books of reference, and need not be transferred to these pages. We shall only quote the words of Lord Northbrook, a retired Governor-General of India, who recently, in the course of a discussion before the Society of Arts upon a paper by Mr. Juland Danvers, sententiously summed up all that can be said as to the social, political, and strategical value of the railway system of India, in the remark, that "no one who had any knowledge of India could doubt that that system was one of the most profitable investments ever made by a great nation." The investment has been a great one, and, until the natives become better used to railways, and the system is rendered more complete, the guaranteed interest upon the capital will make a charge, to some extent, upon the revenues of the Government of India. But the benefits, from whatever point of

view the lines are considered, are so great, that the system of guarantee, begun by the East India Company, and maintained by the Indian Government on the transfer to the Crown, is universally recognised as based upon sound policy. A notable instance of the value of railway communication in facilitating the government of the country was furnished in the course of the journey through India made in 1875-76 by the Prince of Wales. Without the facilities which railways gave, the journey would have been an impossibility; and it is to be remarked, that what the railways rendered possible, in the shape of a friendly journey, would be equally available should some sudden necessity arise for a less peaceful use of them. On this subject Dr. W. H. Russell says, in his *Prince of Wales' Tour in India*, that in the seventeen weeks between his arrival at and departure from Bombay, the Prince travelled 7600 miles by rail and 2300 miles by water, with the result, that he "knows more chiefs than all the viceroys and governors together, and has seen more of the country in the time than any living man."

There are some peculiarities in Indian railway experience so different from what is known in this country, or others where European habits prevail, that they should not escape notice. To show what these are we may quote the following resolution of the Government of India, published at the end of 1875. The document discloses

some peculiarities of native travel which may be better understood by the steps taken to accommodate them, than by a lengthened description of the habits of the country. After some preliminary observations, the resolution of the Indian Government proceeds thus:—

"Any measure calculated to simplify the transport of goods, or make railway travelling more easy, is likely to make railways more largely used. Reduced rates and fares which, of course, have the same effect, might at first result in loss, but, if judiciously made, would probably increase receipts, while at the same time they would lead to extended intercourse among the inhabitants of, and interchange of goods between, districts remote from one another. As regards passenger receipts, they are derived chiefly from passengers in the lower classes. In 1873 the receipts were as follows:—

	RUPEES.
From 1st class . . .	10,88,933
" 2d " . . .	12,47,086
" 3d and 4th classes	1,87,81,158

which include intermediate, third, and cooly or lowest class, sometimes called fourth.

"The receipts from the first two classes were, therefore, but a small, and those of the lower classes, a very large, proportion of the whole. Moreover, while travellers by the lower classes contribute far more in the aggregate than the higher, they are, at present, less able to take care of themselves, and their wants are

sometimes not understood. It is to the treatment of the native passengers, therefore, that the Government of India desire more specially to draw attention.

"Their comforts, and perhaps their strong prejudices, are sometimes too little attended to. The Government of India do not, in saying this, desire to endorse complaints which are too often exaggerated and inaccurate, and not unfrequently unreasonable. Nor do they wish to be understood to sanction in the slightest the view that distinction of caste should confer any privilege in travelling, but simply that there are some reasonable improvements which might well be made. . . .

"*Overcrowding of carriages.*—Though complaints on this score still appear in the native press, it is believed that they are rarely well founded. The best remedy in this, as in all such matters, is to let passengers know what they are entitled to, and thus encourage them to protect themselves; and this can be managed, in respect of overcrowding, by distinctly indicating by notices in the English and Vernacular, in and out side compartments, the number of people they are to hold. With this precaution on every line of railway, and careful instructions to the companies' servants, cases of overcrowding should altogether disappear. Eventually, perhaps, science may succeed in cooling carriages in the hotter seasons, but for the present the true solution of the comfort of native passengers

would appear to lie in an increased quantity of space, sufficient protection from the sun, and ample ventilation; and, in this respect, much as the accommodation has been improved on some lines, upon others it falls short of what, in the opinion of the Government of India, ought to be given. The rule that, in the hot weather, the number of passengers per bench or compartment shall be reduced is a great step in the right direction. Such a rule has been adopted on some lines. The Government of India would desire to see it in force on all.

"*Ill-treatment.*—Cases of ill-treatment are happily now rarely heard of, and the improvement which has taken place in this matter is a cause of gratification to the Government of India. But the railway companies should not cease to press upon their officers of all ranks the necessity for gentle and patient treatment of the native passengers from whom so large a portion of their earnings are derived.

"*Uniforms for railway servants.*—There are rules of some sort on this subject on all railways, but they appear often to be either insufficient or disregarded. Nevertheless the wearing of uniform or some distinctive badge by railway officials is not in India unimportant; for it is manifestly desirable that passengers, and those interested in the conveyance of goods, should be able to readily distinguish all railway servants, and thus know at once to whom

they can refer. Nor should the uniforms or badges be confined to the lower officials, for if this is done, the object of the arrangement to some extent fails. It seems therefore to the Government of India that stationmasters should especially be easily recognisable by some ornament, badge, or peculiarity of dress.

“Extra trains during fairs and festivals.”—Complaints have been made that sufficient arrangements are not made for meeting the extra traffic at the seasons of fairs and festivals. Neglect of this important traffic is of course a direct loss to the companies, and it is not supposed that this is ever wilfully done. But the Government of India think that at such times, if at no others, special facilities might be given for the sale of tickets, either within or without the railway premises, and multiplication of ticket offices might also be often introduced at large stations with advantage. Ticket offices might also be open for a longer time before the departure of trains. These and similar measures would tend to obviate many of the discomforts which a bewildered crowd of natives have often to bear.

“Admission to waiting sheds.”—It is understood to be the rule on some lines that admission to waiting sheds is not allowed until within a short time of a train starting. But such a rule must often lead to hardship, as the majority of native travellers are ignorant, have little idea of the

English hours of the day, and reach stations many hours before the train by which they are to travel is due. If deprived of shelter they would often, therefore, have to endure long, and perhaps severe, exposure to sun or rain.

“Vernacular time and fare tables.”—Such tables are now, as a rule, posted at all railway stations, and the rule should be made absolute in the case of all stations. Similar tables, giving the mileage and fare from the chief terminal stations to every station on the railway, might, it would seem, without much difficulty, be fixed in the interior of all third and fourth class carriages. And if, in addition to this, a system of even money in fares were to be adopted, it would be a great convenience.

“Halts.”—For obvious reasons, there must be halts of longer or shorter duration at certain stations. The complaint has, however, not been uncommon, that passengers of the lower classes cannot leave their carriages until some time after the arrival of the train, and that the object of the halt is thus frustrated. Nor do passengers always know where halts occur, or when they have reached the stations where there are halts. Any information on this head, printed in the vernacular, and exhibited in the lower class carriages, would be of great convenience to the passengers, and the doors of carriages should be unlocked immediately on arrival at stations.

“Refreshments at stations.”—The

most essential refreshment in India is certainly water, and companies have done much in providing this at stations. At the principal stations they have also made arrangements for the sale of food to native passengers. Whether the system, often adopted, of exacting a payment for this privilege of selling sweetmeats and fruit on the platforms is not attended with disadvantage requires consideration. Complaints are still heard in respect of this matter, and if control could otherwise be exercised without any exaction of money, such an arrangement would probably be an improvement. It should also be considered whether suitable refreshment rooms cannot be provided for native passengers, for whom simple food is as much needed as for Europeans. It is not sufficient to say that for that class of native travellers the regular first and second class refreshment rooms are available.

"Cleanliness and lighting."—The want of cleanliness in stations is frequently a matter of report, though less so than formerly; but there is still room for improvement. Deficient lighting is common even on much-frequented lines of railway, the replacement of broken glasses being often neglected, with the result that though there may be saving in glasses, there is extravagance in oil and imperfect lighting. Both are matters which should not be overlooked.

"Planting trees."—One of the greatest recent improvements has

been the planting of trees in the neighbourhood of stations. Had the advantage of this been perceived in the first instance, native passengers would in many instances have now had shade to sit in where they have none. The Government of India commend this subject to all railways. A vast improvement has also been made in the planting of creepers and shrubs at stations at the expense of companies. Nor do the Government of India regard this beautification of stations as of importance chiefly to travellers. It must be a source of considerable pleasure to the companies' servants; and companies have, in the opinion of the Government of India, done wisely, in providing, at what is to them an insignificant expense, a simple means of enjoyment, and an incentive to pride in the stations under their servants' charge.

"Locking of carriage doors."—Some discussion has recently taken place on this subject, and it has been asserted that locking both doors is a protection to passengers. But in this view the Government of India cannot agree. One door, at most, should at any time be locked.

"Forced breaks in a journey."—It has been for some time a question which class of train service is most appreciated by the native community. Whether, for instance, they really are alive to the advantage of rapid travelling, or whether they prefer slow travelling, with long halts for the purpose of cooking their food, and so forth. On some lines the power

of testing these preferences for one system or the other is absent, because native passengers are compelled to break their journeys whether they will or no, and in some cases to make a halt for the whole night. The Government of India would prefer to see arrangements which admit of some choice on the part of travellers, and believe that nothing would be lost to railway companies if this were done.

"Seraiis.—The provision of seraiis is no part of the business of a railway company, but the existence of seraiis in the neighbourhood of stations is a manifest convenience. This is a question which properly belongs to the civil administration and to private enterprise or munificence, and, probably, in no direction could wealthy members of the community more usefully spend money than in erecting seraiis near railways, which are now taking the place of the old lines of communication. Railway companies have already gone far in providing waiting sheds within their premises. For further accommodation beyond this the general community may fairly be looked to.

"Passengers' luggage.—With regard to passengers of the higher classes, the point which seems to call for reform is the luggage rules. These appear to be needlessly restrictive. The circumstances of Indian travelling are so different from those of Europe, that rules which would in the latter case be appropriate are in India vexatious. For instance, on the East Indian Railway, though a certain amount

of free luggage is allowed, a saddle, a basket of fruit, a case of wine or stores, even though within the limit of weight allowed, are proscribed, and must be paid for extra. The rule about the saddle seems singularly out of place in a country when officers on tour ride, and where an officer would often take the train to meet his horse which had been sent on. It would seem, therefore, so long as he carries nothing offensive or dangerous, that a passenger should be almost unrestricted as to the nature of his personal luggage. It would also probably be sound policy to allow native passengers to take a certain weight of baggage with them, no matter whether for sale or not, provided the articles are neither dangerous nor offensive.

"Native Women.—It is obvious that if native ladies are to travel by rail special arrangements of some sort for their convenience must be made. The extent to which these should be carried is the point upon which difficulty arises, but it is doubtful whether the question generally has been sufficiently considered by railway companies. The essentials seem to be—private but not extensive waiting rooms for that class known as *purdahnasheens*, accommodation in seraiis also of a secluded sort. With regard to the means of private ingress and egress to and from trains, the remedy seems to be in the hands of the ladies themselves, by adopting for this purpose the costume commonly worn in Turkey and Egypt, where seclu-

sion of their sex is as general as in India. It is clear that the railway companies cannot provide screens across platforms. All private waiting rooms and also the carriages should be supplied with complete private accommodation ; and there should be means by which water and food could be obtained without any intrusion upon the privacy which it is desired to maintain. How far all this could be done it is not possible to say. Whatever is to be done in connection with serais concerns the local governments and administrations. The other measures should be considered by the railway authorities, and his Excellency the Governor-General in Council has every confidence that they will endeavour to provide, as far as possible, remedies for existing defects."

Another illustration of the influence of native customs on the railways of India is furnished in the following curious extract from one of Mr. Juland Danvers' yearly reports to Government as official director of Indian Railways :—

"We have our holidays and royal visitors and festive gatherings in this country to produce traffic on the railways. In India the same things occur, but there are also religious pilgrimages and festivals and certain customs peculiar to the country, which, as affecting the traffic, it may be worth while to mention. During the past year the passenger traffic on the lines in Western India has been less, in consequence of the

suspension of marriages and the absence of marriage feasts, the year 1872-73 being the one out of every twelfth year in which no marriages take place among Hindoos living between the rivers Kistna and Godavery. Another example was a great bathing festival at the Ganges on the occasion of the eclipse of the moon, when special trains on the Oude and Rohilcund Railway brought large numbers to the river."

As in this country, so there has been a discussion over change of gauge. It was proposed, with a view to economy, to make some of the State railways in India on a narrower gauge than the lines already made there, but strategic value was finally held to be superior to financial considerations, and the "break of gauge" at Lahore, which might not only have imperilled the Punjab, but made the north-western frontier a greater danger to British rule in India than it is, has been saved. The Indus Valley line, originally also projected on the narrow gauge, is to be made on the larger standard, the decision of the Secretary of State for India, in altering the proposal being accompanied by the statement "that it would not be consistent with his duty to allow financial expectations, which are the subjects of much uncertainty, to outweigh the great strategic and political dangers which are constantly growing in importance, and which authorities so high as his Excellency the Governor-General and

the Commander-in-Chief concur with many others in pressing upon Her Majesty's Government."

A RAILWAY TO INDIA.

For many years the project of a through railway to India has occupied the serious attention of British statesmen, soldiers, and engineers. Five years ago a committee of the House of Commons, presided over by Sir Stafford Northcote, now (1877) Chancellor of the Exchequer, sat to consider the question of the "Euphrates Valley Railway" proposals, and took the evidence of many important witnesses, and collected a vast quantity of documentary information. Amongst the latter may be mentioned reports by a large number of members of the consular service in the East, whose knowledge of the countries, of the people, and of the probable traffic which might be looked for, will be found highly interesting.

The prime object in proposing a railway down the valley of the Euphrates was of course to furnish Great Britain with a route to its Eastern possessions quicker, more certain, and less liable to be interfered with by a hostile force, than either the Cape route, the overland journey as it was, or the Suez Canal. But the line by Mesopotamia and Bagdad was only of value as part of a greater undertaking, and all that can be said for that greater undertaking has been brought together in a readable and ingenious way by a young Scotch engineer, Mr. Simon

M'Bean, who in 1876 published a little volume entitled *England to India by Rail*. The opening chapter of this publication says all that can be advanced in favour of such a project, the remainder of the volume being occupied with details and amplifications of the pleas put forward in the following extract:—

"The land communication by railway between Calais and Constantinople will in a few more years be completed if the Turkish Government are properly alive to their interests. There will then be an unbroken line of railway between these remote towns of about 1934 miles in length by the following route, which has been adopted as the shortest and best:—Calais, Lille, Brussels, Liege, Aix la Chapelle, Cologne, Bonn, Wiesbaden, Frankfort, Wurzburg, Nuremberg, Ratisbon, Passau, Linz, Vienna, Presburg, Waitzen, Pesth, Temesvar, Jassenova, Nissa, Sophia, Philippopolis, Adrianople, Constantinople.

"Out of this length of 1934 miles of railway there are still to be constructed about 260 miles through northern Turkey, which the Turkish Government should be urged to complete as speedily as possible—from Jassenova, near Belgrade, to Tartar Bazarjick, including a bridge across the Danube at the former place.

"Should the tunnel under the English Channel ever be completed, we can then ride in our railway carriage from London to Constantinople, a distance of 2034 miles, without changing carriages.

"Having thus obtained railway communication from one end of continental Europe to the other, are we going to stop there? We have been set a good example by the Americans, who, to connect their eastern and western seaboards, constructed a new line, nearly 2000 miles long, in a very short period of time. We have an empire in the east as well as a kingdom in the west; and we propose to connect them by railway, with the exception of the twenty-two miles of sea in the English Channel, which the French and English engineers propose to tunnel. The Bosphorus channel is also an impediment to through railway communication; but as its width is no insuperable barrier, nor its depth any obstacle, it may be successfully tunnelled, or steamers large enough to take the entire train on board may be successfully used, as there is no tide to contend with. We propose, then, to construct a double line of railway from Constantinople through Asiatic Turkey, along the Euphrates valley, through Persia and Beloochistan and Scinde to Kurrachee, a distance of 3330 miles, as follows:—

Constantinople to Scanderoun	720 miles.
Scanderoun to Aleppo	80 "
Aleppo to Karkisia	220 "
Karkisia to Hit	190 "
Hit to Bagdad	115 "
Bagdad to Bussorah	202 "
Bussorah to Bushire	300 "
Bushire to Persian Eastern boundary	728 "
Persian boundary to Kurrachee	715 "
Total Distance, Constantinople to Kurrachee	3330 "

of which the last 1450 miles are along the coast of Persia and Beloochistan, and could therefore be constructed very expeditiously, and afterwards maintained very much more easily than if the route were more inland, besides being subject to the healthy influence of the cool sea-breeze during construction, and also in travelling over it, instead of sweltering in a hot steamer through the Red Sea at eleven knots an hour.

"In addition to the above, it is proposed to construct a branch line, starting from Antioch, and, keeping along the Syrian and Palestine coasts, to join the Egyptian system at Ismailia, having minor branches to Damascus sixty-five miles long, and to Jerusalem thirty-two miles, the total length being 600 miles. This branch would put Egypt and Palestine in direct communication with Europe and the East generally. Jerusalem would be only four days from London instead of a fortnight as at present, and the whole delta of the Nile for about 1000 miles would be open to travellers from all parts of Europe and the East in a few years.

"From Kurrachee to Kotree, a distance of 106 miles, the railway is made; but there is a gap of 330 miles to be constructed to connect Kurrachee and Bombay between Ahmedabad and Kotree. We have, then, at this present moment, on this proposed route between London and Bombay, the

following lengths of railway made in Europe and Asia :—

London to Dover . . .	78 miles.
Calais to Jassenova on the Danube . . .	1323 "
Tartar Bazarjidd to Constantinople . . .	351 "
Total distance in Europe already constructed . . .	1752 "

In Asia we have as follows on the route to Bombay already constructed in India only :—

Kurrachee to Kotree . . .	106 miles.
Ahmedabad to Bombay . . .	351 "
Total in India . . .	457 "
Grand Total . . .	2209 "

"The total distance to be traversed between London and Bombay by the proposed route, shown on accompanying map, is as follows :—

London to Dover . . .	78 miles.
Dover to Calais (English Channel) . . .	22 "
Calais to Constantinople . . .	1934 "
Constantinople to Scutari . . .	2 "
Scutari to Kurrachee . . .	3330 "
Kurrachee to Bombay . . .	787 "

Total distance by railway and sea from London to Bombay along European-Asiatic route . . . 6513 "

And assuming that we could pass over the whole length of this enormous distance at the rate of thirty miles throughout, we have eight days thirteen hours required to accomplish it. We may be enabled by more perfect arrangements to travel over this railway by express trains at the rate of forty miles an hour throughout, allowing sufficient time, in addition, to cross the two straits, the English Channel and the Bosphorus, thus traversing the entire distance, from London to

Bombay, in 154 hours, or six days ten hours. This is perfectly feasible if we could persuade our continental neighbours to allow us to pass over the 1934 miles of their lines at the desired speed. Of course, it could only be done by our express trains, and special traffic arrangements being made to permit of its accomplishment over continental railways.

"The following is a statement showing what has to be done in railway construction on the proposed route to Bombay through Central Europe and Asia :—

Turkey, in Europe—Jassenova to Tartar Bazarjidd . . .	260 miles.
Turkey, in Asia—Scutari to Persian boundary . . .	1587 "
Persia . . .	1028 "
Beloochistan . . .	695 "
Scinde—Bombay to Kurrachee . . .	20 "
India—Kotree to Ahmedabad . . .	330 "
Grand Total in Asia . . .	8660 "

"The Turkish Government will construct the 260 miles to connect their railway from Constantinople to Tartar Bazarjidd with the European system at Jassenova, near Belgrade. We have the task before us of constructing the 3330 miles of railway required between Scutari and Kurrachee, as well as the 330 miles from Kotree to Ahmedabad to render the chain of communication complete between London and Bombay.

"The Turkish Government will no doubt, in the interests of its own preservation, and to more readily put down rebellion in the future, construct in European Turkey, as speedily as possible,

the 260 miles of line required between Jassenova and Tartar Bazarjidl. It behoves us, then, to be on the alert ; and begin the construction of the continuation eastwards from Scutari for the following reasons :—

“ 1. The time occupied in the journey and voyage—*via* Brindisi and the Suez Canal—from London to Bombay is at present twenty-one days. It is proposed to reduce that time by this route to an average time of seven days’ travelling.

“ 2. The cost of first-class journey and voyage to Bombay is now about £60. It is proposed to reduce it to £48 by this railway, including living for seven days.

“ 3. The voyage through the Red Sea is certain death to invalids at particular seasons. This railway will pass through cooler regions, and consequently healthier ; and invalids will be more comfortable than in the Red Sea, and sea-sickness will be altogether avoided except in crossing the English Channel, and now, perhaps, that may be avoided also.

“ 4. Troops and munitions of war can be expeditiously sent to and returned from India, instead of enduring the wearisome and unhealthy voyage in the troopship through the Red Sea and Indian Ocean ; and on any sudden emergency arising, a very few days would put our defences and troops in readiness, and a great annual saving would be effected thereby.

“ 5. New and hitherto inaccessible outlets for our waning trade would be opened up in Asia Minor, Persia, and Beloochistan.

“ 6. The countries of Asia Minor, Syria, Armenia, the valley of the Euphrates, Persia, and Beloochistan, would be awakened into life once more, and the Cross would everywhere advance while the power of the Crescent waned in the East. Vast new fields would be opened up to our missionaries around the cradle of the human race. Missionary enterprise would be active where the human race began its course, and the gospel of salvation be preached where sin had its origin.

“ 7. The Russian Empire has been projecting a scheme under the management of Monsieur de Lesseps, whereby it means to connect St. Petersburg, Kiva, Bokhara, Samarcand, Cabool, and Peshawur, through long stretches of desert and arid country, for purely military reasons, which will, to some extent, undoubtedly assist trade in Central Asia, and may divert trade to St. Petersburg that would otherwise come to India and England. She may be coming into our market for the money to construct this railway. Would it not be better for us to give the money to construct the proposed European-Asiatic railway, and serve our own purposes in opening up Asiatic Turkey—a very fertile country—and constructing a highway through the Holy Land, upon which Russia is casting longing eyes continually,

and thus assist in thwarting her designs? Have we not done enough in aiding and throwing away our resources on foreign railway development?

"8. By taking energetic means to enter upon this project while the Government of Turkey is strong, we occupy the ground on the shortest route to the East, from which no chicanery or diplomacy can afterwards dislodge us, and we prevent the success of Russian designs upon Turkey more effectually than by any other visible means in our power now or at any future time.

"9. *We require another way than the Suez Canal to the East.* Should a general war arise in Europe, and it may not be far distant, the probability is, that the Suez Canal would be blocked up by means of treachery (the greatest injury that could possibly be inflicted upon our Eastern trade). One or two old hulks, seemingly traders, might be passed in and sunk in the centre of the channel without the possibility of preventing it, and thus block it up for months. Besides, stronger vessels than our own might bar our way through. But supposing that Central Europe were disturbed, and the canal blocked up, our traffic between India and China, and Constantinople, could be carried on by this railway and by steamers from London, Southampton, Liverpool, or elsewhere, to Constantinople and Scutari and Iskenderoon. To avoid the possible danger of a sudden cessation to our enormous

trade through the Suez Canal we are bound to provide another route to the East, and the best route is that laid down in the accompanying map.

"10. The branch line through the Holy Land from Antioch would place Jerusalem within four days' journey of London, and open up the Holy Land to the whole of Europe, which would undoubtedly flock there, and Egypt and the whole valley of the Nile would be within five days' journey of London, thus saving to invalids a rough voyage from Brindisi to Alexandria of 3½ days.

"11. We have many competitors in the iron, wool, and cotton trades on the continent now, among those who were once our customers, and we desire a new outlet for our declining trade in those wares. This railway alone will afford a tremendous impetus to our trade and commerce generally. It will require about one million tons of iron for rails and fastenings only, besides a vast weight of iron for bridges, and a great variety of every imaginable description of export goods during construction.

"12. Our prestige among European nations will be established on a firmer basis than ever, and we shall get rid of our Russophobia I trust for ever, rendering Russia's power to injure us inoperative by having the right of way through the threatened territories an established fact to the whole world, the only earthly

custodians of the Holy Land, although nominally subject to Turkey.

"13. The fact of through traffic from London to Constantinople existing and benefiting all the European nations interested in preserving the peace, and powerful enough to do so, will undoubtedly be the means of ensuring, through the interested motive of possessing undisturbed communication, what nothing else than force could hitherto do—the keeping of the peace of Europe. Closer commercial intercourse is a strong provocative to peace among civilised nations, and is instrumental in lulling jealousies.

"14. Greater enlightenment would dawn upon all Europe and Asia through this regular intercourse with England, and truth would penetrate and dislodge error from many fair and fertile regions in both continents.

"15. Another most important consideration which will have its influence on all our transactions is that our communications with China, Japan, and the whole Eastern seas, and Australia and New Zealand, will be greatly accelerated, and rendered safer and more free from these annual deplorable losses of lives, ships, and valuable cargoes in the Red Sea, and at Point de Galle, and innumerable other places. The Red Sea will be avoided by the mails, and by passengers who desire rapid travelling; and Point de Galle as a port of call will be exchanged for Colombo. The Ceylon Govern-

ment is constructing a new break-water at Colombo, at a cost of about £750,000, under the direction and from the designs of Sir John Coode, which will be completed in six or seven years, and form a safe harbour in all states of the weather, besides giving facilities for loading and unloading alongside wharves, now totally wanting. In connection with this change from Galle to Colombo, as the mail port, it is to be hoped that the Imperial Government will see the wisdom of constructing the Paumben Canal through the island of Ramiseram, which forms portion of the reef called Adam's Bridge, connecting Ceylon and the mainland of India. By cutting this canal, and making it navigable for large ships, the trade between the East and the West would have a shorter passage by 700 miles on the voyage out and back, or about three days' steaming. Steamers from Bombay to Colombo, Madras, and Calcutta, would thus save annually sufficient to afford liberal dues to make the canal pay handsomely. This project has been for many years persistently advocated by Sir James Elphinstone, both in Parliament and out of it, and it is to be hoped that the Imperial Government will at last sanction what should have been completed many years ago, in the interests of trade and safety to shipping.

"A port for repairs is greatly needed in Southern India, and no better or safer position than Ramiseram could be found for this purpose between Calcutta and

Bombay. There is ample and convenient shelter in connection with the canal for the construction of graving docks on an economical scale, and being on the highway east and west would be found of great service. It would be connected with the Southern Indian railways from Madura, and ships could coal as well as be repaired, thus materially developing the Indian coal trade and effecting a great saving to shipowners and others. Making a secure harbour of refuge of Ramiseram as well as a canal, will be the means of saving many ships, lives, and valuable cargoes annually, and a railway will yet be constructed from Colombo to it, thus uniting Ceylon and India.

"The construction of the European Asiatic Railway will benefit Europe and Asia infinitely more than the construction of the Pacific Railway will benefit the United States of America, or the Canadian Pacific Railway, the Dominion. The Dominion is comparatively

poor, yet it is willing and anxious to make the line from Ottawa to Bute Inlet, on the Pacific, a distance of 2710 miles, through almost untrodden regions, at a cost of about £32,000,000; then why should we hesitate in expending £60,000,000 to connect our Indian Empire with Europe and ensure the safety of southern Europe against Russian aggression, and have the right of way through Asia Minor and Palestine, which will again become fertile countries under our beneficent rule and management? There is so glorious a future awaiting us after the construction of the European-Asiatic railway, that we should press onwards to obtain the realisation of unbroken railway communication from London to Calcutta. The next step onwards will be from Calcutta to Peking, through Ava, Bamo, Yunnan, and along the Yang-tse-Kiang to Nanking, thence to Peking."

The detailed cost of this great scheme is stated as follows:—

Constantinople to Aleppo	800 miles at £18,000	£14,400,000
Aleppo to Bussorah	787 "	12,000 9,444,000
Bussorah to Persian Boundary	1028 "	13,000 13,364,000
Persian Boundary to Kurrachee	715 "	15,000 10,725,000
Kotree to Ahmedabad	330 "	12,000 3,960,000
Palestine Branches	600 "	15,000 9,000,000
Total	4260	<u>£60,893,000</u>

In time tables the writer shows that while in point of actual distance travelled, the journey from Calcutta would not be much abridged, the time occupied would be shortened in a remarkable degree. By Brindisi and the Red Sea the distance to Calcutta by

the shortest journey now available is 7282 miles, and occupies 31 days. By the Calais, Constantinople, etc., route, the journey would be 7120 miles, but the time occupied only 9½ days!

As those pages are passing through the press, the Eastern

question has assumed serious importance, and the mode of communication with India has become of more lively interest. In face of events which may at a moment upset any opinion expressed here, it is not possible to estimate accurately how far solicitude on account of our use of the Suez Canal, or the assumed aggressive intentions of Russia, may be well founded. As bearing, however, on the question of a railway to India, the following remarks of the *Times*, published early in May 1877, may be worthy of preservation :—

‘Much weight was naturally given [before the Euphrates Valley Committee] to military considerations, and among the witnesses were Sir Henry Rawlinson and Lord Sandhurst. The former of these two authorities will certainly not be suspected of any trust in the good intentions of Russia, for his book on her conquests in Central Asia is the arsenal of those alarmists who predict a Muscovite invasion of India, although he himself is not responsible for the use to which they put his argumentative weapons. Sir Henry was asked by the Committee what would be the strategical value to England of a Euphrates railway, and we invite the public to consider the significance of his answer. He replied that as a means of guarding India from a Russian invasion such a railway would have no strategical value whatever, since it did not come within 1200 miles of the

threatened line of attack. That line, he added, stretched from the south-east corner of the Caspian towards Herat and the Indus.

“It may be said that Russia could use a railway through the Euphrates or the Tigris Valley for the transport of her troops to the Persian Gulf. But, meanwhile, we should command the sea, and be able to close the neck of the Gulf so tightly as to make such an enterprise nothing better than an attempt to court destruction. As Lord Sandhurst and Sir Henry Rawlinson pointed out, the value of the route by the Suez Canal depends on our command of the sea at both ends of the passage, and the very power which enables us to hold the Red Sea and the Mediterranean for our own purposes would equally enable us to defeat any designs of Russia by holding the Persian Gulf. No dream would be wilder than the idea that Russia could find a way to India by the Euphrates when our ships could securely wait for her soldiers. Nor do the alarmists consider the ease with which we could prevent the Russians from making such a line of communication by occupying the port which must be the terminus. Nor, again, do they bear in mind the enormous expense and time which would be required to carry a line of railway from the Black Sea to the Persian Gulf. The Select Committee estimated that the work would cost £10,000,000. We may safely assume that even if Russia had not incurred the enormous

pecuniary expenses of the present war, she would not have been able to make such a railway for at least twenty years. She would certainly complete her system of lines in Europe, and even attempt to execute the long-planned railway through the desert steppes from Orenburg to Tashkend, before she would even plan so gigantic an enterprise as a line from the Black Sea to the nearest outlet of the Indian Ocean. That she would ever attempt to execute a work which would be at the mercy of the English navy, which might find no sufficiently profitable trade for centuries, and which would be absolutely worthless as a military engine, is a supposition which taxes the powers of human credulity." The allusion to the Russian project of a railway from Orenburg—the present terminus of its system—to Tashkend points to a line which, if made, might prove of serious import politically to British India.

RAILWAYS IN CANADA.

The Dominion of Canada possessed, according to the figures already quoted, 4443 miles of railway open for traffic at the end of 1875. Although the strategic questions which bulk so largely in the consideration of the railways of India have not the same force when applied to Canada, it is not to be forgotten that along the southern border of the Dominion we have also a frontier on which, should a difference leading to actual war between the mother

country and the United States unhappily occur, military operations of magnitude and interest might be witnessed. In the pages of Mr. Sandford Fleming's interesting volume, entitled *The Intercolonial*, will be found a detailed history of the thirty years' negotiation and subsequent activity which followed the conclusion of the Ashburton Treaty of 1842, ending in the through opening of the railway which now joins the maritime provinces of the Dominion to Canada proper. In that narrative, while the projection of the ceded territory, which now forms part of the State of Maine in the United States, is seen to have been a blunder which British statesmen may deplore, it is obvious that in all questions of making a road or railway to afford communication between the British North American provinces, the military value of the line held a leading place. If it went too near the elbow of Maine, it might be, in time of war, made the subject of a sudden raid; if too near the sea, it might be exposed to attack in that direction. An endeavour was made to reconcile those conflicting considerations, and now that the Intercolonial Railway is completed, the fervent hopes of both nations doubtless are that the success of the "Combination" route as regards safety from attack may never be put to the test.

Of more interest than this line is the "Canadian Pacific Railway," designed to furnish an actual, as there is already a political, union

between Canada and the district of British Columbia, Vancouver's Island, on the Pacific shore. This line, of 2500 miles long, is perhaps the most stupendous railway undertaking ever entered upon; yet we are told that when, in 1871, by compact with British Columbia, the Dominion of Canada engaged within ten years to construct a railroad from Lake Nipissing, in Ontario, to the Pacific Ocean, the Dominion Government of the day possessed absolutely no information as to the nature of the vast undertaking to which they pledged the good faith and resources of the country. The intervening period since that rash bargain was made up till recently has been occupied in ascertaining, at an enormous cost, what the commonest prudence should have suggested to be the first proceeding. The nature of the country through which this great railway is destined to run is described in the following extract from the *Toronto Globe* of 12th May 1874, given in a Blue Book containing correspondence on the subject of the railway and the guarantee for the interest of part of the capital given by the British Government:—

“The area which has been subject to survey can hardly cover less than 1,000,000 square miles. Its extreme limits embrace 54 degrees of longitude and 10 of latitude, or reduced to miles represent 2700 miles in length, and from 300 to 500 miles in breadth. A large proportion of this was,

three years ago (in 1871), an unknown wilderness. If a comparison of the extent of what we will call the Canadian Pacific territory were sought in the eastern hemisphere, we should find its counterpart in a region stretching from the coast of France across Belgium, Holland, Germany, Prussia, and Russia, to the Ural Mountains in Asia, and covering a considerable portion of these countries. The botanical and geographical characteristics of this region naturally divide it into three great sections.

“Commencing with the most westerly, which is partially wooded and almost entirely mountainous, we find, perhaps, the most difficult and costly portion of the work to be accomplished. Two great mountain ranges bar the pathway of the surveyor who desires to run a line from the Saskatchewan to the Pacific: first, the Rocky Mountains proper, and next, as the coast is approached, the Cascade range. The former, however, present a series of elevated plateaux, with passes that admit of comparatively easy access. The highest of these passes are from 6000 to 7000 feet above the sea level, the lowest, 2000 feet. Numerous independent ranges, known as the Cariboo, Selkirk, and Gold ranges, form a sort of advanced guard to the Rocky Mountains on the western slope. The Cascades rise abruptly from the sea level, looking bold, defiant, and all but insurmountable. The average height of many is from 5000 to 8000 feet. It will tax all the skill of the engineer

to reduce the gradients in the district to working limits. Between the Rocky and Cascade mountains lies an elevated plateau, intersected by rivers running through deep channels, and threading their way around mountains that here and there lie in their route." After much correspondence, the question between Canada and British Columbia, with reference to this railway, was referred to the Earl of Carnarvon, who decided that a certain portion of the line (about sixty miles at the British Columbia end) should be made with all practicable despatch; that a waggon road and telegraph should at once be constructed over the whole line; that the Dominion Government should spend not less than two million dollars annually in going on with the line; and that, by the end of 1890 the line from the Pacific seaboard as far as the western end of Lake Superior should be completed,—thus bringing British Columbia into the range of water communication with the eastern ports of Canada, and thence with Europe. Looking at what has been done by the United States in the construction of a line over the "Rockies" to California, the result is mortifying to British enterprise. But the larger population at both ends, the more temperate climate, and the more rapid progress in the States, may be held to explain fully why the endeavours of the British colony to reach across the continent are more tardy. One of the chief probable sources of value for

this line was stated by Mr. Charles W. Eddy, in an address to the Colonial Institute on the National Distribution of Coal throughout the British Empire :—"This great railway system will commence on the Atlantic, in one coal field, will cross another as it approaches the most arduous part of its task,—the scaling of the Rocky Mountains; and will terminate in a third on the shores of British Columbia, and immediately opposite the excellent coal of Vancouver's Island. Nature herself seems in many ways to indicate this as a great, trunk line of international communication, not only by reason of its being the nearest air-line, to use an American expression, but by the bountiful supply of coal and of timber along its track, by the low level of the country, and the great fertility of the land along the fertile belt of the Saskatchewan, that 'garden wilderness of the world,' and by the isothermal lines, which show its temperature, though in so high a latitude, to be very much that of New York."

• THE RAILWAYS OF THE WORLD.

The following statistics show the railways existing in the various countries of the world at the end of 1875, and the number of square miles of territory for each mile of railway open. It will be seen that, as regards the latter, Belgium takes precedence of Great Britain and Ireland, the densely-populated little kingdom having developed

a complete network of railways, radiating as from a centre from the town of Malines. Railways in Great Britain and its dependencies are excluded below, having been given in an earlier page :—

EUROPE.	Miles of Railway.	Sq. Miles of Territory to each Mile of Line.
Belgium . . .	2,174	5
Switzerland . . .	1,300	11
German Empire . . .	17,472	12
France . . .	12,376	14
Denmark . . .	561	18
Netherlands . . .	1,016	20
Austria and Hungary, . . .	10,154	20
Italy . . .	4,817	23
Spain . . .	3,822	50
Roumania . . .	770	59
Portugal . . .	596	61
Sweden . . .	2,237	63
Turkey in Europe . . .	965	138
Russia in Europe . . .	11,991	157
Norway . . .	339	387
Greece . . .	7	2,658
AMERICA.		
United States . . .	74,890	48
Cuba . . .	400	109
Chili . . .	820	211
Uruguay . . .	190	385
Peru . . .	1,280	519
Argentine Confederation . . .	990	520
Honduras . . .	56	704
Costa Rica . . .	29	843
Paraguay . . .	45	1,373
Mexico . . .	372	1,905
Brazil . . .	1,038	3,819
Colombia . . .	66	6,883
Venezuela . . .	8	45,461
AFRICA.		
Algeria . . .	335	116
Egypt . . .	955	1,222
Tunis . . .	37	1,218
ASIA.		
Russian Caucasus . . .	627	270
Java . . .	163	314
Turkey in Asia . . .	172	2,677
Japan . . .	38	4,110

The following are the totals, British railways being included in this case :—

	Miles of Railway.	Ratio to Square Miles of Territory.
Europe . . .	83,864	46
America . . .	82,335	195
Africa . . .	1,657	920
Asia . . .	6,822	277
Australasia . . .	2,285	2,068
Total	176,963	693

To the above grand total for the world has to be added a railway of four kilometres in length—rather less than three miles—in Tahiti, and also the Woosung railway in China, of which a portion was opened in 1876.

Supplementary to the above figures a few details only need be given. In every case the progress of railway construction has been gradual, and the facts brought out as regards the railways of the United Kingdom will also be found to apply with more or less exactness to the history of railways in other countries. To France belongs the credit of following very early in the footsteps of Britain, both as regards the introduction of tramroads and the construction of locomotive railways. In 1783 a tramroad existed at the famous ironworks of Creusot, and others were subsequently constructed. In 1835 the first railway, that from Paris to St. Germain, was projected, and was finished in 1835. In the course of thirty years the entire mileage open was about 8500 miles, about one-half more having been added in the subsequent decade.

As the first American railway was opened for passengers on the last day of 1829, the "Jubilee" cannot be held there for some time. This was, we believe, a part of the Baltimore and Ohio line; but locomotive power had been used for a time previously on a railway connecting the Delaware and the Hudson canals. From Poor's *Railway Manual*, the

standard reference for all that belongs to railways in the United States, is found remarkable evidence of the energy and enterprise of the American nation. In 1830 there were 23 miles of railway in use in the United States; by 1840 the mileage was increased more than a hundred-fold, standing at 2818 miles; in 1850 the extent was 9021 miles; in 1860, 30,635 miles; in 1870, 52,898 miles; while, by the end of 1875, there were 74,890 miles of railway in use, or one mile of line for every 48 square miles of territory. The greatest year was 1871, when 7660 miles of new railway were opened,—or nearly as much in one year as existed in Great Britain altogether thirty years after the opening of its premier line! What such progress in railway-making meant may be judged from the statement of Sir Charles Dilke, who, in his *Greater Britain*, says,—"In 1870 we shall reach San Francisco from London in less time than by the severest travelling I could reach it from Denver in 1866." The appearance of the railway in the prairies or partially cleared forests of the States afford often a striking picture of the contest of man with nature, and Dr. Lardner has very well said that "to the traveller in those wild regions, the aspect of such artificial agents of transport in the midst of a country, a great portion of which is still in the state of native forest, is most remarkable. . . . It is not easy to describe the impression of those refinements of

art and science with the wildness of the country, where one sees the frightened deer start from its lair at the snorting of the ponderous machine, and the appearance of the snake-like train which follows it."

"There is no adaptation," remarks Sir Charles Dilke, "to railways of the Limerick saying about rivers, namely, that Providence has everywhere so placed them as to pass through the great towns; for in America railways precede population, and when mapped out and laid they are but tramways in the desert."

RAILWAYS IN THE FAR EAST.

As information is not so accessible with reference to some countries as to others, the following sketch of the railways of the Dutch settlements in the islands of the East Indies and other parts of the "Far East," may be given here. Recently the Government completed surveys for a line destined to connect Padang, the seat of government in Western Sumatra, with the district known as the Lampongs, bordering on the Straits of Anjer. Padang is distant from Batavia some three to four days' steam, and at certain seasons of the year the passage is boisterous and stormy in the extreme. A few years hence the journey will be reduced to one of a day's duration, the sea passage being a very short one, and, when Anjer has been brought into communication with the latter port, quite insigni-

ficant. The country through which the line is being carried is the haunt of herds of wild elephants. These animals have a habit of rubbing their bodies against the telegraph posts erected there, and this is affirmed to be the most frequent cause of that interruption to communication which has so severely tried the patience of the mercantile community resident at both of these termini. A commission from Siam visited Java whose object was to inspect the construction and working of the Dutch lines, with a view to the introduction of the railroad system into Siam. The latter country is amply intersected by canals, rivers, creeks, etc., and it is estimated that about 220,000 tons of rice alone are annually brought down to Bangkok from the upper rice districts. The cargo boats by which this produce is conveyed are chiefly manned by women, and as the waterways are often blocked by timber rafts hundreds of yards in length, and no progress is made at night, much valuable time is consumed, not to speak of the loitering at certain stations where the passion for gambling, to which the Siamese are so much addicted, is indulged to the full by all the assembled boatmen and boatwomen. Should the railway system be adopted in Siam, a large number of women will be deprived of employment, and some day the foreign residents at Bangkok may be relieved of the necessity of keeping up a boat and boat's crew—no slight matter to

many possessing slender purses—and be afforded the opportunity of visiting some of the remoter places of interest in that kingdom, at present a sealed book to all but a few.

It was in the latter half of 1863 that the Netherlands India Railway Company obtained their first Act enabling them to constitute the company. Operations were first begun at Samarang, and a few years later part of the line was in working order and opened to the public. The company now possess two distinct lines, the main one extending between Samarang (one of the three leading ports in Java, situated on its north coast not quite midway between Sourabaya and Batavia) and Djocjokerta in a southerly direction, with a branch on the right to Willem I. The gradients at a few places are stiff, but engineering difficulties, as a whole, do not seem to have been numerous or formidable. The length of this (the main) line is 203 kilom., and the cost of construction is set down at 19,101,153 guilders—equal to a mileage cost of about £12,700. The subsidiary line (opened for traffic in 1872) starts from Batavia, near the western extremity of the island, and terminates at Buitenzorg, the country seat of the Governor-General, and famed for the salubrity of its climate—a distance of 58 kilom. It traverses a level and rich pastoral and agricultural strath, costing to build no more than 3,354,875 guilders, or, roundly speaking, £7350 per mile. The Dutch Government have de-

cided on building all future lines on State account. At present they have in hand two or three lines. One of these, fast approaching completion, begins at Sourabaya, and runs, *via* Passaroeang, through a flat district full of sugar, rice, indigo, and tobacco-growing estates, to Bezoeki at the extreme east (Oost-hoek or East-neuk) of the island. This railway will one day be extended eastwards till it joins that starting from Samarang. A second line will connect with the existing one terminating at Buitenzorg, and proceed through a magnificent mountainous territory abounding in fertile valleys where are grown the finest crops of white rice and world-famed Java coffee, known as the Preanger Regencies, as far as Bandong, then southwards to Tjilatjap, a free port facing the Indian Ocean.

The railway opened in Java paid, in 1873, a dividend of $2\frac{1}{2}$ per cent; in 1874, $3\frac{3}{4}$ per cent; in 1875, $4\frac{1}{2}$ per cent; and, in 1876, $5\frac{1}{4}$ per cent.

Japan, as our tables show, had, at the end of 1875, railways open to the extent of 38 miles. A line of railway connects Yokohama with Yedo; another runs from Ko-bé to Os-aka; and this is being rapidly extended to Kioto and the populous places *en route*. The construction of those lines was in

the first instance intrusted to English engineers, but the Japanese, in this, as in other European arts they have adopted, are engaged in training native men to supply all that is required both for the scientific and the practical branches of railway working.

The Woosung railway, in China, which at one time threatened to lead to some difficulty between the British Government and that of China, was partly opened in 1876. The Shanghai correspondent of the *Times*, writing on July 7, stated that the Woosung railway was then, so far, a great success. The day following the opening was given up to the Chinese. "Excursion trains were run all day, carrying as many Celestials as could be crowded into them, free; and the efforts to avail themselves of the privilege were the climax of the interest that has been shown all along in the undertaking. Since then full fares have been charged, and the desire to make trips continues. Two days ago a train started some minutes before its time because it was crammed full, and to get it off seemed the best way of stopping the demand for tickets." Later advices show that the Celestial mind, as represented by its government, is opening to the advantages of this invention of the outer barbarian.



CHAPTER V.

So, carried on by your unwearied care,
We rest in peace and yet in motion are.

Dryden—to Lord Chancellor Hyde, 1662.

SOME SPECIAL FEATURES OF RAILWAYS—SPEED ON THE RAILWAY—
REFRESHMENT ROOMS—SUMPTUOUS TRAVELLING—ACCIDENTS ON
RAILWAYS—RAILWAY SERVANTS—THE STATION-MASTER—THE
BOOKING CLERK—THE PORTER—PLATELAYER AND SIGNALMAN—
ENGINE DRIVER AND GUARD.

SOME SPECIAL FEATURES OF RAILWAYS.

“YOUR railroad, when you come to understand it, is only a device for making the world smaller.” Those words of Mr. Ruskin, quoted in an earlier page, come back to memory now that we proceed to show, not how railways were first conceived and made, not how they were supported and opposed by various people; not how the profession of the engineer has notably risen to the task of making railways, or how the system has grown to be measured by tens of thousands of miles on all the continents; but, in as distinct a manner as may be possible within the space at disposal, some of the social features which the growth of railway travelling has developed.

We have seen that one promoter, at all events, ventured to peep through the veil of obscurity which enshrouded the first essay at rapid travelling on the Stockton and Darlington railway, and that one public writer did not hesitate to predict a social revolu-

tion not second in importance to that of the invention of printing. When George Stephenson prophesied that the time would come when it would be cheaper for a working man to travel on the railway than to walk, and Charles Maclaren held that the early experiments on which he wrote had established principles which would “give a greater impulse to civilisation than it has ever received from any single cause since the Press first opened the gates of knowledge to the human mind,” they were ahead of their time, but what they foresaw has been fully realised. Yet it remains nevertheless true, that the railway has left mankind substantially as it found them. The world has been made smaller, as Mr. Ruskin puts it; the provincial towns of the kingdom have been made but as suburbs to the metropolis, as Mr. Maclaren put it a generation earlier. Our progress through the air has risen from the three miles an hour

of the old stage waggon, to twenty times that speed in the modern express, but the character of the traveller, the varied characters of the travellers, we should rather say, remain without change. Sir Walter Scott's picture in the opening chapter of the *Antiquary*, for example, needs little change to fit it for the traveller per rail:—"He who is bent upon a journey is usually easily to be distinguished from his fellow-citizens. The boots, the greatcoat, the umbrella, the little bundle in his hand, the hat pulled over his resolved brows, the determined importance of his pace, his brief answers to the salutations of lounging acquaintances, are all marks by which an experienced traveller can distinguish at a distance the companion of his future journey, as he pushes onward to the place of rendezvous." For "the boots" read the "travelling rug," or "the newspaper," or "the guide-book," or other of the impedimenta of the modern traveller, and the picture remains complete!

This picture, however, has too limited a range, for the universality of the use of the railway is its distinguishing feature. From the poor Irish reaper, travelling cheaply in a "stand-up" cattle-truck, to the sumptuous comfort of the Pullman car or the Royal train, we find all "ranks and conditions of men" using the modern marvel, rendered familiar by every-day use. Many efforts have been made to illustrate this in a pointed way, one of the applications of the case being that of a

Scottish clergyman, now deceased, who published a series of sermons on the Railway, taking for the text of his address on "The Station" the appropriate words in Proverbs xxii. 2, "The Rich and Poor meet together: the Lord is the Maker of them all." Another and more familiar illustration of the microcosm which a railway presents for study is the popular painting, by Mr. W. P. Frith, R.A., entitled "The Railway Station," in which the many ordinary incidents of the departure of a principal train are brought together, and an excellent conception is obtained of the customs and costumes, the architecture (the scene being the Paddington Station of the Great Western Railway), the various officials, and other features which distinguish railway life in our day.

The following descriptions of some of those features are from the pen of Mr. Charles Knight and others:—

"The noblest sight that a railway can furnish is, to our minds, not the equal adoption of its advantages by the rich classes and the commercial classes—by the bishop travelling to his see and the mill-owner returning to his spindles; but by the smock-frocked agricultural labourer, whistling in the short course of his sixpenny ride—a free man, who is not bound to his parish where the wages of labour are doled out, not to the most skilful, but to the most burthensome. . . . The road and the railway are the

tracks in which the highest civilisation must, in our generation, | march to its triumphs over ignorance and misery."



"The earl or duke, whose dignity formerly compelled him to ride in a post-chaise and four, at the rate of five or six shillings

a mile, and a considerable consumption of horse-flesh, wax-lights, and landladies' curtsies on the road, now takes his place unnoticed in a first-class carriage next to a gentleman who travels for a great claret and champagne house, and opposite another going to report a railway meeting in Birmingham for a daily paper. If you notice a railway official politely escorting a lady to a carriage marked engaged, you may be sure she is the wife of one of the principal officers of the company. A bishop well muffled up in great-coat and cravat creates no sensation, but a general rush of porters and superintendents towards a carriage betrays the presence of a director or well-known engineer.

"There is very little medium in parliamentary passengers about luggage,—either they have a cart-load or none at all. Children are very plentiful, and the mothers are accompanied with large escorts of female relations, who keep kissing and stuffing the children with real Gibraltar rock and gingerbread to the last moment. Every now and then a well-dressed man hurries past into the booking-office as if ashamed of what he was doing. Sailors arrive with chests and hammocks. The other day we had the pleasure of meeting, in the same carriage, a travelling tinker, with the instruments of his craft neatly packed; two gentlemen, whose closely cropped hair and pale plump complexion betokened a recent residence in some gaol or philanthropic institution; an economical

baronet, of large fortune; a half-pay officer, with a genteel wife and twelve children, on his way to a cheap county in the north; a party of seven Irish, father, mother, and five grown-up sons and daughters, on their way to America, after a successful stay in London; a tall young woman and a little man from Stamford, who had been up to London to buy stone bottles, and carried them back rattling in a box. In a word, a parliamentary train collects—besides mechanics in search of work, sailors going to join a ship, and soldiers on furlough—all whose necessities or tastes lead them to travel economically, among which last class are to be found a good many quakers. It is pleasing to observe the attention the poor women, with large families and piles of packages, receive from the officers of the company, a great contrast to the neglect which meets the poorly-clad in stage-coach travelling, as may still be seen in those districts where the rail has not yet superseded the stage-coach."

Since those words were written, "third-class" travellers have assumed much greater prominence and popularity than in the earlier years, through the plan introduced by the Midland Railway Company of England, and now almost universally adopted, to carry third-class passengers by every train. The kindly picture Mr. Knight draws of the way an "unprotected female" is assisted by the railway officers may be set against the

snarl of one of the innumerable pamphleteers who, before the change to which we refer, says "the stage-coach on which he used to get a lift with a cheerful greeting from the coachman and guard has been driven from the road, and the railway substituted, where the third-class passenger is despised by the money-taker, snubbed by the porter, and looked upon as an intruder and encumbrance by the railway director." Since Mr. G. W. Jones, the advocate of "Universal Penny Railways," published those words, this despised entity, the third-class traveller has taken quite a new place in the railway economy; and if the farm servant who, on being told to give the largest share of turnips to the cow that gave the most milk, laid the largest heap beside the pump, were now to receive such an order regarding the milk cow from which railways derive their largest revenue, he would bestow the preference on the once despised third-class traveller.

On the American railways passengers are not, as a rule, differently classed, or admitted at different rates of fare, as are those in Europe; this fact no doubt suggesting the couplet in the song of the 'Gospel Train,' as sung by the Jubilee Singers who lately visited Britain:—

"No second class on board the train,
No difference in the fare!"

SPEED ON THE RAILWAY.

In the course of this volume

speed in travelling has been frequently mentioned. The uneasy shambling of the sedan-chair finds its speed increased to a spirited run in the jin-riki-sha, or "man-power carriage," of Japan; the glass coach, a fortnight upon the road between Edinburgh and Glasgow, gives place to the brilliant exploits of Mr. Palmer's mail coaches; and the slowly grinding progress of the heavy steamers of 1820 has been succeeded by the splendid vessels which cross the Atlantic, from port to port, in nine days. In like manner, the growth of speed upon railways has been very marked. The attainment of a speed of 15 miles an hour on the opening of the Stockton and Darlington was thought tremendous; then writers like Mr. Maclaren spoke speculatively of 20 miles an hour as probable, of 30 miles an hour as possible. Gradually the speed has been put on, till, in Britain, there are trains running, day after day, with an average speed of more than 40 miles an hour, and a maximum of sixty or even higher, at some points of their route. Still greater feats of speed have, however, been accomplished, chiefly on the broad gauge (now discarded), of which the following may be quoted:—Mr. Brunel, with the courier class of locomotive, ran 13 miles in 10 minutes, equal to 78 miles an hour. Mr. P. Stirling, of the Great Northern, took sixteen carriages 15 miles in 13 minutes, equal to 75 miles an hour. The 'Great Britain,' 'Lord of the Isles,'

and 'Iron Duke,' broad gauge engines on the Great Western Railway, have each run, with four or five carriages, from Paddington to Didcot, in $47\frac{1}{2}$ minutes, equal to 66 miles an hour. The Midland coupled express engines, running in the usual course, have been timed 68, 70, and 72 miles an hour. The 10 A.M. express on the Great Northern from Leeds has been timed and found, mile after mile, at the rate of a mile in 52 seconds, or at 69.2 miles an hour. The engines used in the last case were Mr. Stirling's outside cylinder bogie express engines, the load being ten carriages.

The 'Flying Dutchman' is, without doubt, for a comparatively short distance, the fastest train in the world. It runs from London to Swindon, seventy-seven miles, in eighty-seven minutes, being at the rate of 53 miles an hour, while Exeter ($193\frac{3}{4}$ miles) is reached in $4\frac{1}{2}$ hours, giving an average pace of $45\frac{1}{2}$ miles per hour. The "limited mail" of the London and North Western, while running to Edinburgh northward and Holyhead westward, has trains travelling the 401 and 264 miles respectively at a pace of 40 miles an hour. The Midland conveys its passengers to Leicester, $97\frac{1}{2}$ miles, in one hour and $37\frac{1}{2}$ minutes, the pace being $44\frac{3}{4}$ miles. The London and Brighton, by their fast trains, run to "London-by-the-Sea" in an hour and ten minutes, the rate being 43 miles an hour; and the South Eastern takes Channel passengers to Dover at 41 miles an hour.

On the Continent we do not find anywhere such pace as we have just mentioned. The French express, from Calais to Paris, is the fastest French train, doing 37 miles an hour on an average; while, from Paris to Marseilles, a distance of 537 miles, travellers are conveyed in $15\frac{3}{4}$ hours, or at a rate of 34 miles an hour. Swiss railways are extremely slow, expresses only attaining a speed of 22 miles an hour. In Belgium the highest speed is 33 miles an hour; and in Holland $33\frac{1}{2}$ miles. The journey from Berlin to St. Petersburg, 1028 miles, is traversed in 46 hours, the pace being $22\frac{1}{2}$ miles an hour.

On this subject a chatty writer in *Blackwood's Magazine* for December 1876, says:—"The railway is essentially a child of British invention and enterprise. British people had to go abroad after as well as before they had railways at home, and it was of necessity that they should take that part of their travelling appointments with them. I note some particulars in which I have found arrangements in railway management in other lands, such as we might do well in imitating here; but had not the system been born and reared on this side of the Channel, the old *diligence* and *eilwagen* might still have been, for all we can see to the contrary, the standard travelling organisation over the great high-roads of Europe."

We have already seen (p. 420) that in America also there is a lower speed maintained than in

Great Britain. In the course of the year 1876 great rejoicings were made over the feats accomplished by the so-called "lightning train" between New York and San Francisco, by which that tremendous journey was reduced within a limit of three and a half days. Although the *average* speed even with this "lightning train" did not exceed what has been seen in Britain, the event was not unworthy of being recorded with some of the American journalists' characteristic tall talk. The San Francisco correspondent of the *Times* thus described the inauguration of the train :—

"The arrival of the 'lightning train' from New York to San Francisco in less than 84 hours has caused an intense amount of excitement in this city, and as the success of the trip has its lessons, and is one of public interest, a slight account of it may be acceptable to your readers. The party invited by Messrs. Jarrett and Palmer, the projectors of the trip, assembled at Astor House, New York, and proceeded to Jersey city, where the train was in readiness awaiting their arrival. They left the latter place June 1, at 1 h. 3 min. A.M., and arrived at Oakland Point, San Francisco, June 4, at 9 h. 22 min. A.M. Hence the apparent running time was 80 h. 19 min., which added to the difference of longitude, 3 h. 13 min. 7 sec., would give the actual time as 83 h. 32 min. 7 sec. The exact time, making allowances for detention of pass-

engers and crossing the bay of Francisco, was 83 h. 59 min. 16 sec. The arrival of the party was hailed by a salute of cannon discharged from the roof of the Palace Hotel, where the new arrivals took up their quarters. A grand demonstration, headed by the Mayor and most of our leading citizens, welcomed the adventurous passengers to San Francisco. From particulars gathered from one of the party, it appears that the whole journey was one continued triumph. All along the road, wherever a station was passed, the inhabitants of that part of the country had assembled with torchlights, bonfires, and other evidences of satisfaction, to hail the passing train, which, seen for a moment, was soon lost to view as it rolled on its course without let or hindrance. From Jersey city to Pittsburg 344 miles were passed over in ten hours without a stoppage, and the Mississippi river was crossed 24 hours after leaving Jersey city. The last 800 miles of the distance were accomplished with only one engine, and the engineer who conducted the train over this perilous line at such a terrific speed had his services publicly acknowledged by the grateful passengers. A party, consisting of the president and several officers of the Pennsylvania road, accompanied the train to the boundary line, and when they left the principal officers of the various lines passed over joined the party. Relays of locomotives were kept in reserve along the

road at distances of from one to two miles, and a locomotive was always in attendance behind. The utmost precautions were taken by every divisional superintendent, who carefully examined the road at every switch, and saw that the entire line of his division was well guarded. The high rate that has thus been maintained for over 3000 miles, and the fact of the journey having been accomplished without inconvenience or accident, shows what may and probably will be done hereafter. The rate of speed varied according to the nature of the road traversed, but on no part of the journey did the travellers experience the same sensation as when the train, without the aid of steam and with brakes down, thundered from the dizzy heights of the sierras, literally bounding over chasms and precipices which, passed over in ordinary circumstances, are enough to cause a feeling of uneasiness in the best regulated mind. Fortunately, perhaps, darkness in a great measure shut out from the view of the travellers much of the fearful danger they safely passed over, and the only result of the journey at its termination was a feeling of dizziness in the head, such as is experienced by many on landing after a rough sea voyage. The enterprise originated with Mr. Jarrett, of the theatrical troupe of Jarrett and Palmer, who, after some difficulty, obtained the consent of the various railroad managers to the experiment. It is probable that it is a very costly

one to him, but no doubt he has correctly calculated his chances of its eventually turning out a very profitable method of advertising his *troupe*, and he is perfectly satisfied with the prospects of the venture."

At one part of the journey sixty miles were accomplished in 57 minutes, and "It beats the telegraph!" was the delighted exclamation of Mr. Jarrett. From Chicago to Omaha, 492 miles, was run in 10 hours 42 minutes, or $48\frac{1}{2}$ miles per hour, and at another part of the journey 75 miles were run in 80 minutes. This train, however, is the exception that may be said to prove the rule, as American trains on an average run very slowly, as, for example, on the Intercolonial Railway $20\frac{1}{2}$ miles an hour is the ordinary pace, and from Buffalo to Stratford 33 miles is the greatest speed.

In connection with the same American railway a French journal, *La Gazette Anecdote*, furnishes the following story, illustrative of the enterprise and ingenuity of the journalists of the States:—"The Grand Pacific Railway has a car especially devoted to the publication of a journal called the *Transcontinental*. It very justly prides itself on being the most rapidly informed paper of the United States. It is entirely printed on the journey between New York and San Francisco, and *vice versa*, and it provides the two cities on the arrival of the train with all the news that it

has gathered on its transit. There is a printing machine and the editor's room in the car. At every station where the train stops reporters come to meet it with their 'copy.' The number of impressions depends entirely on the demand at each station. At those stations where the train does not stop the papers are simply thrown out of window. An entire edition is often printed between two stations."

REFRESHMENT ROOMS.

It is remarked by a recent writer that "the permanent element amid all the flux of the railway stations is to be found in the refreshment room." The characteristics of a nation may, perhaps, be traced in the mode in which the refreshment of the inner man is attended to in connection with railway journeys, and the remark we have quoted is truly British. Just as our earliest railway carriages preserved, to as large an extent as was possible, the character of the travelling carriages they superseded, so did our railway hotels and refreshment rooms partake largely of the stately, and, it may be added, expensive character of the former resting-places for travellers. And we owe to America the first idea of a method of feeding railway travellers, which shall be *en rapport* with the novelty of the system to which it is an adjunct. As a sketch of what a railway refreshment room was like thirty years ago, we give from

Stokers and Pokers Sir Francis Head's description of the Wolverton station refreshment room, which is still tolerably accurate, though the genius of "Spiers and Pond" has somewhat altered matters. He first describes the duty of the staff of "young ladies" at this place:—

"The odd man wakens the two housemaids, to one of whom is entrusted the confidential duty of awakening the seven young ladies, in order that their *première toilette* may be concluded in time for them to receive the passengers of the first train, which reaches Wolverton at 7.30 A.M. From that time until the departure of the passengers by the York mail train, which arrives opposite the refreshment room at about eleven o'clock at night, these young persons remain on duty, continually vibrating, at the ringing of a bell across the rails, from the north refreshment room for down passengers to the south refreshment room provided for hungry up ones. By about midnight, after having philosophically divested themselves of the various little bustles of the day, they all are enabled once again to lay their heads on their pillows, with the exception of one, who in her turn, assisted by one man and one boy of the establishment, remains on duty receiving the money up till four in the morning for the up mail. The young person, however, who in her turn performs this extra task, is allowed to sleep on till noon, when she is expected to take her place

behind the long table with the rest.

"The scene in the refreshment room at Wolverton, on the arrival of every train, has so often been witnessed by our readers, that it need hardly be described. As these youthful handmaidens stand in a row behind bright silver urns, silver coffee-pots, silver tea-pots, cups, saucers, cakes, sugar, milk, with other delicacies over which they preside, the confused crowd of passengers simultaneously liberated from the train hurry towards them with a velocity exactly proportionate to their appetites. The hungriest face first enters the door, *magna comitante caterva*, followed by a crowd very much resembling in eagerness and joyous independence the rush, at the prorogation of Parliament, of a certain body following their leader from one house to the bar of what they mysteriously call 'another place.' Considering that the row of young persons have among them all only seven right hands, with but very little fingers at the end of each, it is really astonishing how, with such slender assistance, they can in the short space of a few minutes manage to extend and withdraw them so often—sometimes to give a cup of tea—sometimes to receive half-a-crown, of which they return two shillings—then to give an old gentleman a plate of warm soup—then to drop another lump of sugar into his nephew's coffee-cup—then to receive a penny for a bun, and then again threepence for four 'lady's fingers.' It is

their rule as well as their desire never, if they can possibly prevent it, to speak to any one; and although sometimes when thunder has turned the milk, or the kitchenmaid over-peppered the soup, it may occasionally be necessary to soothe the fastidious complaints of some beardless ensign by an infinitesimal appeal to the generous feelings of his nature—we mean, by the hundred-thousandth part of a smile—yet they endeavour on no account ever to exceed that harmless dose. But while they are thus occupied at the centre of the refreshment table, at its two ends, each close to a warm stove, a very plain matter-of-fact business is going on, which consists of the uncorking of, and then emptying into large tumblers, innumerable black bottles of what is not inappropriately called 'Stout,' inasmuch as all the persons who are drinking the dark foaming mixture wear heavy great-coats, with large wrappers round their necks—in fact, are *very stout*. We regret to have to add, that among these thirsty customers are to be seen quite in the corner, several silently tossing off glasses of brandy, rum, and gin; and although the refreshment room of the Wolverton Station is not adapted for a lecture, we cannot help submitting to the managers of the Company, that, considering not only the serious accidents that may occur to individual passengers from intoxication, but the violence and insolence which drunken men may inflict upon travellers of

both sexes, whose misfortune it may be to be shut up with them ; considering moreover the ruin which a glass or two of brandy may bring upon a young non-commissioned officer in the army, as also the heavy punishment it may entail upon an old soldier, it would be well for them peremptorily to forbid, at all their refreshment rooms, the sale, by any of their servants, to the public, of ardent spirits.

"But the bell is ringing violently calling the passengers to 'Come, come away!'—and as they have all paid their fares, and as the engine is loudly hissing— attracted by their pockets as well as by their engagements, they soon, like the swallows of summer, congregate together and fly away."

In justice to the railway *hotels*, it may be stated that one cause why they have preserved, and perhaps even augmented, the high charges of an earlier day, is because their customers have a merely fleeting character.

"In most of these huge hotels," writes one complainer, "there is considerable difficulty in obtaining a very late supper or a very early breakfast, and occasionally for want of a chimney there is no ventilation in the bedrooms. A friend of mine was refused an early breakfast in one of the hotels, and was told that if he wanted it he might get it below in the refreshment room. He gave his card and refused to pay his bill unless he had some breakfast. The breakfast was not given him,

but the amount of the bill was never asked for."

A much more attractive picture of careful attention to the "inner man" is that presented by the Leicester station refreshment room, where dinner is served for the passengers travelling north or south by the day "drawing-room car" on the Midland Railway. The inauguration of this dining arrangement, on the opening of the Midland through route in May 1876, is thus described in the *Railway News* of the date :—

"At Normanton an important step has been taken in that important matter of refreshments at railway stations. There are few things probably in which practical questions interfere so largely with notions of theoretical perfection as in this matter of railway refreshments. In theory nothing can be more simple than that every traveller by railway should have provided for him punctually and at the moment of his arrival everything that his fancy or appetite should suggest. The demands of appetite and the demand for speed are, however, antagonistic, and the difficulty hitherto has been, and indeed always will exist to a greater or less extent, to reconcile the two conflicting interests. Much has been done in the arrangements now made at Normanton to reconcile the conflicting demands. In the first place, the railway company guarantees the stoppage of the train for half-an-hour. A good deal may be done in that time provided the traveller

goes 'straight to business.' Economy of time is sought to be obtained by a very simple process, and in which the travellers may do much to facilitate their own comfort. In the carriages will be found small handbills, in which the contractors, Messrs. Spiers and Pond, invite the co-operation of the passengers in their work of providing for their creature comforts. This handbill is as follows :—

"Messrs. Spiers and Pond invite attention to the *table d'hôte* provided at Normanton station expressly for travellers by this train, served immediately on its arrival. The Midland Railway Company have made arrangements for the train to stop at Normanton for half-an-hour, to allow time for dining. To assist the contractors in making the necessary provision, passengers will much oblige by stating, in the annexed space, the probable number of their party who will dine, and handing the notice to the attendant who will present himself at the carriage at Leicester station.'

At Leicester the total number for whom dinner is to be provided is telegraphed on to Normanton. The dinner consists of the following :—

Spring Soup.	
Salmon Cutlets,	Sauce Tartare.
Lamb Cutlets, Green Peas.	
Fillets of Beef Larded,	Sauce Piquante.
Jellies.	Creams.
Cheese.	Salad.

On the arrival of the train seats are found placed in the dining-

hall for the guests, the soup is smoking in the plates, ready for immediate action. While the soup is being disposed of, the waitresses, neat handed and neatly attired—how much better than the greasy black coat and white necktie of the male waiter?—place opposite each guest his plate of fish ; this, in turn, gives place in the same manner to the *entrée*, or joint ; and pastry or jelly, ale and wine, in bottles, are placed within easy reach of the traveller, who can make his own selection. The great causes of delay, with its consequent irritation and annoyance, are avoided ; and something has thus been done, which deserves a word of commendation, to secure that 'good digestion' should wait upon appetite. Although the first day, the new arrangements worked smoothly and well, and all went on their way well satisfied that some of the difficulties connected with the railway refreshment question had been solved.

"There is yet more to be done, especially in the way of breakfasts, at our large railway stations. To many persons leaving by an early morning train it would be a great convenience if they knew they could obtain a good breakfast before starting ; and, on the arrival of the trains in the morning, arrangements of a like nature would be very welcome to a large proportion of the travellers. The luxury of the drawing-room car, the comforts of the sleeping-car, the substantial luncheon or dinner have been provided—will Messrs.

Spiers and Pond devote their attention to the very important matter of a clean and substantial breakfast at our railway stations?"

SUMPTUOUS TRAVELLING.

It is not a little remarkable that, while every one is disposed to credit America with the invention of the long train-like carriage, which formed the germ out of which the more pretentious 'Pullman Car' has been developed, the proposal that railway carriages should be built in this form is to be found in those essays by Mr. Charles Maclaren from which we have already quoted so largely. Writing in 1824, he said:—

"In the construction of the steam coach, the object should be to unite the highest practicable velocity with as many comforts and accommodations as possible. With this view, perhaps, a form analogous to that of the steamboat and trackboat would be the best. It might, for instance, consist of a gallery 7 feet high, 8 wide, and 100 feet in length, formed into ten separate chambers, 10 feet long each, connected with each other by joints working horizontally, to allow the train to bend when the road turned. A narrow covered footway, suspended on the outside, over the wheels on one side, would serve as a common means of communication for the whole. On the other side might be outside seats, to be used in fine weather. The top, surrounded with a rail, might also be a sitting-place or promenade

like the deck of a trackboat. Two of the ten rooms might be set apart for cooking stoves, and various accommodations; the other eight would lodge 100 passengers, whose weight, with that of their luggage, might be 12 tons. The coach itself might be 12 tons more; and that of the locomotive machine, 8 tons, added to those, would make the whole 32 tons. *Each of the short galleries would rest on four wheels, and the whole would form one continuous vehicle.*" To those who are familiar with the "bogie" arrangement, by which an enormously long carriage is made to travel over abrupt curves through being fitted, on a swivel, to low four-wheeled trucks, the words we have put in italics appear especially remarkable.

Of the Pullman cars, as used in America, the following description affords a fair idea:—"You write comfortably at a table in a little room called a 'drawing-room,' entirely closed off, if you wish it, from the rest of the car; which room contains two large and comfortable arm-chairs and a sofa, two broad clear plate-glass windows on each side (which may be doubled if the weather is cold), hooks in abundance for shawls, hats, etc., and mirrors at every corner. Books and photographs lie on the table. Your wife sits at the window sewing, and looking out on long ranges of snow-clad mountains or on boundless ocean-like plains. Children play on the floor, or watch at the windows for the comical prairie dogs sitting near

their holes, and turning laughable somersaults as the car sweeps by. The porter calls you at any hour you appoint in the morning; he gives half an hour's notice of breakfast, dinner, or supper; and, while you are at breakfast, your beds are made up, and your room or your section aired. About eight o'clock in the evening—for, as at sea, you keep good hours—the porter, in a clean grey uniform, comes in to make up the beds. The two easy-chairs are turned into a berth; the sofa undergoes a similar transformation; the table, having its legs pulled together, disappears in a corner; and two shelves, being let down, furnish two other berths. The freshest and whitest of linen and brightly-coloured blankets complete the outfit; and you undress and go to bed as you would at home, and, unless you have eaten too heartily of antelope or elk, will sleep as soundly."

In this country, where there is no journey so long as to embrace both night and day for days together, as in crossing the American continent, the Pullman cars are of two kinds,—a "drawing-room car," for day use; and a "drawing-room sleeping car," for the night journey between London and Scotland.

Following up this division into a new field, a party of ladies and gentlemen made a pleasure tour over a large portion of Great Britain in two Pullman cars, with a third car attached for cooking, "tubbing" etc. One of the party thus de-

scribed the new departure in the matter of railway travelling and railway hotels:—

"I have just returned from a 26 days' trip in two Pullman palace cars, and as it is the first thing of its kind, you may not be unwilling to receive a short account of it. We started from St. Pancras on the 2d ult.—a party of seventeen ladies and cavaliers, four servants, two guards, and a porter—having a drawing-room car and a sleeping car, also a roomy luggage van for cooking stoves and morning tubs; a piano from Chappell, that shuts up like a portfolio, conduced much to the merry evenings we passed on board. Of course, all hands slept in the cars—in fact, it was our hotel, *minus* the bill with its overcharges. We stopped at Matlock, Buxton, Melrose, Edinburgh; crossed the ferry at Burntisland, on to Perth, Birnam, Killiecrankie, Kingussie, Inverness, Dingwall, Strome Ferry, Thurso, for John o' Groat's, Wick, and home by way of Gairloch; saw all the West Highlands, Glasgow, Carlisle, and so back to St. Pancras. The natives called us Yankees, coming in crowds to gaze through the windows, but very civil. The bridges on the Highland lines were close shaves for the Pullman, but a miss is as good as a mile."

Fine carriages, lofty, roomy, and lengthy, divided in the ordinary way, but running on bogies, are now provided on the Midland line and the Great Western for through special purposes, and over

the railway system generally carriages are vastly improved within ten years back. On the Brighton line Pullman "drawing-room cars" were introduced about the end of 1875, and the following sketch on the occasion of the first run down to the fashionable watering-place shows an interesting glimpse of the social and sociable results of the new method of travel:—

"Some modern philosopher, taking it for granted that all men wear spectacles, though not all of glass, remarks that the world is good or bad, handsome or ugly, lovely or unlovely, according to the spectacles we wear. Well, if this be so, the spectacles seen through in the plate glass of a Pullman car make the world appear decidedly beautiful. Battersea Park, lighted up by a gleam of saunshine that shows to full effect the manifold variegated colours of its autumn foliage, is most charming, and not less so is the country farther on, the long series of furze-covered commons, thickly dotted over by villa residences, that stretch from the Thames up to the Surrey Downs. Through Croydon station, where nearly all Brighton trains stop, the new express rushes swiftly, bent on reaching its destination without any halt or delay, and by this time the travellers in the Pullman car, most of whom seem to be first visitors of it, have become sufficiently acclimatised to the gilded atmosphere to enter upon conversation. Here is another

instance of the curious fact, attested by all who are in the habit of frequenting the Pullman trains on the Midland, that the drawing-room car passengers differ so far from most ordinary first-class passengers as to launch, more or less freely and unrestrainedly, into talk with each other. The phenomenon is capable of explanation in several ways. The drawing-room, to begin with, although an eminently cheap place of sojourn in this instance, gives a high air of respectability to all its inmates. You may imagine in an ordinary first-class compartment your neighbour a thief, and be shy of getting too near to him, but it is almost impossible to do so in the Pullman car. Everything looks so grand within that the most preternatural suspicion must needs be lulled to rest. Besides, the red-velvet arm-chair in which your neighbour sits, or, perhaps, leans backward in luxurious ease, having drawn it at exactly the right angle—"the angle on which angels may rest and float," as some Yankee said—harmonising with his innermost feelings, is in every position at such a respectful distance from your own individual throne that the contact of either foot or elbow is impossible. Then, again, it is so easy to break off conversation if unwelcome. Instead of being fixed to the same position for the length of the journey, one has but to move the head, and the arm-chair follows, the former 'vis à vis' becoming a 'dos à dos.' It is very much easier to turn in a Pullman

arm-chair than to 'turn on one's heel,' and, what is more, it cannot give offence to anybody, since it is a movement constantly in operation by the inmates of drawing-room cars. They all seem to think that whereas the chairs were made to turn on their own axis, it is best to turn them constantly. Here is a lesson that might be brought into infinite use in modern civilisation. What a boon to mankind it would be if all things, animate and inanimate, could be made to turn easily on a pivot; if, for example, we could turn our houses, so as to face northwards in the summer and southwards in the winter; or, better still, if we could turn our creditors so as never to face us. We muse on this idea as the train is flying from Surrey into Sussex, and come to the conclusion that Pullman is a man that understands his time."

While every important railway company possesses a number of "saloon" carriages, which can be hired for private and family use, crowned heads are the only persons for whom special carriages are maintained. Queen Victoria was, as we have seen, an early supporter of the use of the railway; and, in the thirty-five years which have elapsed since she began to use them, there have been many fine suites of carriages prepared for the royal use. While every effort was made in these carriages to provide for comfort, convenience, and safety, and many little arrangements were made to

lessen the fatigue of those flying journeys from Osborne to Balmoral so often undertaken by her Majesty, the carriages themselves were sumptuously, as well as artistically, fitted up, realising the delicate taste and attractiveness of a pretty drawing-room, as well as the ease and seclusion of a boudoir and sleeping apartment. On the occasion of the Queen's last visit to the Continent, the firm of Evrard of Brussels supplied a train of carriages for the royal party. These carriages were arranged for seven persons—the Queen, the Princess Beatrice, the three ladies accompanying the Queen, the Minister in attendance on the Queen, and one other gentleman. They were connected together by a passage, and the exterior was made rather simple, without display of crown or arms, so as not to attract too much attention. The interior was divided into three parts. In the centre were the royal apartments, composed of a sleeping, a sitting, and a dressing room. The hangings of the sleeping and sitting rooms were of rich green bronzed silk, manufactured at Lyons, and reproducing the rose, shamrock, and thistle. The dressing-room furniture was in Indian style, and the room was adorned with paintings of tropical scenery. The splendid sitting-room furniture was suited to the tint of the hangings, and the coverings were of pale blue silk. The handles of the doors were of bronze in the Louis XVI. style. The two beds in the sleeping-room were separated by a pass-

age, and the bed curtains were of the same stuff as the hangings. The train, which is to be kept at Brussels when not in use, is destined for the journeys on the Continent of her Majesty and the members of the royal family.

ACCIDENTS ON RAILWAYS.

As "accidents will happen in the best regulated families," so it has been found that no railway system, however perfect, can be kept wholly free from accident. A glance at the statistics of the subject confirms this, for while there is without doubt a proportion of the recorded accidents which might be termed "preventible," there are some which appear to be due to causes not within the control of man.

Mr. F. J. Bramwell has thus classified railway accidents:—

Collisions of various kinds	58·7 per cent.
Trains going on wrong lines	12·0 "
Leaving the rails	9·2 "
Defects in rolling stock	9·2 "
On inclines	4·6 "
Entering stations at too high a speed	1·8 "
Miscellaneous	4·5 "
	<u>100</u>

Deaths of passengers from causes beyond their own control	35½ per annum.
Journeys taken (exclusive of season-ticket holders)	397,478,249
Journeys per death	11,000,000

Including season-ticket holders, it may thus be said that the chances are 12,000,000 to 1 against any single passenger being killed in railway travelling. It is probably a safe conclusion that no arrangements can be devised, the working of which must depend on human and fallible means (whether

directly by the operation of man or indirectly through automatic apparatus devised by him), which will wholly prevent accidents on the railways of the world. It is one of the controversies of the age whether it is better to trust to mechanical or to manual safeguards, and another question for discussion is whether railway companies should be left to their own responsibility or directed by legislation in the detailed management of their business. There are not wanting writers and speakers who seem to look upon railway directors and managers as wholly devoid of the most ordinary feelings of humanity, and as practising unsafe courses because it is cheaper to pay the cost of an accident now and then than to incur the expenses necessary to ensure safe working. Such persons are simply reproducing what Sydney Smith, in his famous "locking in" letters, wrote when railway management was in its infancy. "There will," writes the opponent of locked carriage doors, "be, every three or four years, some dreadful massacre—whole trains will be hurled down a precipice, and 200 or 300 persons will be killed on the spot. There will be every now and then a great combustion of human bodies, as there has been at Paris; then all the newspapers up in arms—a thousand regulations forgotten as soon as the directors dare—loud screams of the velocity whistle—monopoly locks and bolts as before." And in another place he says, speaking of the justification

of the practice against which he waged successful war, "There is a strong propensity in mankind to travel without paying, and to lock mankind in till they have completed their share of the contract is benevolent because it guards the species from degrading and immoral conduct, but to burn or crush a whole train, merely to prevent a few immoral insides from not paying, is, I hope, a little more than Ripon or Gladstone will bear."

It would not serve any purpose of value to attempt a description of the horrors of a railway accident. A catastrophe of the kind is generally instantaneous, affording a striking illustration of the words of the Bible,—“When they say peace and safety, sudden destruction cometh upon them.” There is not the same opportunity for the development of prolonged heroism, or cool intrepidity in the danger, such as our steam-boat narratives present; though here again we find that an American writer has embalmed in verse the bravery of a railway servant, whose self-sacrifice and remarkable presence of mind in his last moments have been thought worthy of preservation, in the following lines by Whittier, which give the incident too faithfully to need any words of explanation:—

Conductor Bradley (always may his
name

Be said with reverence), as the swift
doom came,

Smitten to death a crushed and
mangled frame,

Sank with the brake he grasped just
where he stood,
To do the utmost that a brave man
could,
And die, if needful, as a brave man
should.

Men stooped above him; women
dropped their tears
On that poor wreck, beyond all hopes
and fears,
Lost in the strength and glory of his
years.

What heard they? Lo! the ghastly
lips of pain,
Deaf to all thought save duty's,
moved again:
“Put out the signals for the other
train!”

No nobler utterance since the world
began,
From lips of saint or martyr ever
ran,
Electric, through the sympathies of
man.

Ah me! how poor and noteless seem
to this
The sick-bed dramas of self-con-
sciousness,
Our sensual fears of pain, and hopes
of bliss!

O grand, supreme endeavour! Not
in vain
That last brave act of failing tongue
and brain!
Freighted with life, the downward
rushing train,

Following the wrecked one, as wave
follows wave,
Obeyed the warning which the dead
lips gave:
Others he saved, himself he could
not save.

Nay, the lost life *was* saved! He is
not dead

Who in his record still the earth
shall tread,
With God's clear aureole shining
round his head.

We bow as in the dust, with all our
pride
Of virtue dwarfed the noble deed
beside.
God give us grace to live as Bradley
died.

Numberless advices have been issued to the public for the avoidance of railway accidents so far as these depend upon the passenger himself. As regards those accidents which are beyond the control of the passenger, it has been wittily remarked, that "absence of body" is to be preferred to "presence of mind" in a collision. Still, much may be done to lessen the effects of a calamity when it does occur, by the preservation of a cool head; and the following rules of Dr. Lardner, applicable to accidents of both kinds, are worthy of being carefully kept in mind:—

Rule I. Never attempt to get into or out of a railway carriage while it is moving, no matter how slowly.

Rule II. Never sit in any unusual place or posture.

Rule III. It is an excellent general maxim in railway travelling, to remain in your place, without going out at all until you arrive at your destination. When this cannot be done, go out as seldom as possible.

Rule IV. Never get out at the wrong side of a railway carriage.

Rule V. Never pass from one side of the railway to the other except when it is indispensably necessary to do so, and then not without the utmost precaution.

Rule VI. Express trains are attended with more danger than ordinary trains. Those who desire the greatest degree of security should use them only when great speed is indispensable.

Rule VII. Special trains, excursion trains, and all other exceptional trains, are to be avoided, being more unsafe than the ordinary and regular trains.

Rule VIII. If the train in which you travel meet an accident by which it is stopped at a part of the line or at a time where such a stoppage is not regular, it is more advisable to quit the carriage than to stay in it; but, in quitting it, remember Rules I., IV., and V.

Rule IX. Beware of yielding to the sudden impulse to spring from the carriage to recover your hat which has blown off, or a parcel dropped.

Rule X. When you start on your journey, select if you can a carriage at, or as near as possible to, the centre of the train.

Rule XI. Do not attempt to hand an article into a train in motion.

Rule XII. If you travel with your private carriage, do not sit in it on the railway. Take your place, by preference, in one of the regular railway carriages.

Rule XIII. Beware of proceeding on a coach road across a railway at a level-crossing. Never do so without the express sanction of the gatekeeper.

Rule XIV. When you can choose your time, travel by day

rather than by night ; and, if not urgently pressed, do not travel in foggy weather.

The twelfth rule refers to a practice now wholly discarded, and is illustrated by an accident of an alarming character that happened to the Countess of Zetland and her maid, when travelling on the Midland Railway in 1847. The carriage caught fire from the sparks of the engine ; and, after enduring much agony and risk, the maid leaped off and was seriously injured, and the carriage was entirely destroyed. The practice of securing a reserved compartment, or of hiring a saloon carriage, now supplies all the privacy or reserve the most wealthy or the most fastidious can desire.

Writers of fiction have not been slow to take up railway accidents as a "sensation" with which to enhance the interest of their stories, and it may be preferable to give the picture of a "dreadful railway accident" in this form rather than recount any actual incident of horror :—

"Joe, the pointsman, fell asleep again while still speaking, leaning in his drowsy stupor against the desk ; and the sound of his heavy breathing, mingled with the sharp, low ticking of the clock, as one by one the precious, priceless seconds fell like tiny drops of water into the great gulf of eternity. There was a long, long pause ; and then a shaking of the earth, and the harsh, strident note of the steam-whistle aroused Joe from his uneasy slumber, and with

dismay he saw, on looking up at the signal-stand, that the arrangement of the warning-lamps had been altered ; and he knew that he had neglected his duty, and that nothing but a miracle could stave off the coming evil. One bound, and he was out of his box, and rushing towards the levers. Could he reach them, and set clear the rails before the red eye hurrying down upon him should bring its baleful presence nearer, all might yet be well. But the red eye was too near, and the clash and clang of the whirling wheels too close at hand, and on, on dashed the northward-bound express to meet its fate. There was a crash, and a roar, and a wild, dismal scream from the engine, mingling with and almost drowning the shrieks of human voices, and then a fearful sound of grinding metal and splintering wood, and hissing steam, and a dull thud, as though a fighting giant had been beaten down to earth at last ; and then a confused medley of noises, predominant over which was a wild wail of anguish—and the mischief was done. The North express was off the rails, several carriages were knocked to matchwood, all were more or less damaged ; and the bursting of the boiler, and the red glow of the burning carriages nearest to the fire of the overturned engine, threatened the survivors of those who had suffered in the catastrophe with death in a shape yet more dreadful. Loud, shrill, and piercing arose the cries of those imprisoned

among the broken timbers : 'Help! help!' Help, fortunately, was within call. From the pit-bank hard by came running a score of stalwart men, black as coal-dust could make them, swart and uncomely copies of the Good Samaritan, but who nevertheless worked like so many Titans in the task of tearing away shattered woodwork and twisted iron, to set the victims free before the cruel fire should creep, like a red snake, to where they lay. From the station and from the village arrived fresh contingents of shouting rescuers, and heavy masses of ruin were dragged away, and water, hastily brought, was flung upon the smouldering embers of the sullen conflagration, and there was a Babel of voices uplifted in every possible key that could express alarm, horror, and pity ; for by this time many women, from the colliers' cottages nearest to the scene of the accident, had come upon the ground."

Truth is, however, stranger than fiction, and an uncomfortable sensation may assail the passenger by a "night express," should he travel shortly after having read such a shocking story as that of the "scene in a signal box"—where a signalman and his companions, including the relief signalman who came on at night, had a deep carouse, leaving a boy of fourteen to "attend to the levers."

RAILWAY SERVANTS.

The establishment of railways

has created a class of officials of marked character. The railway directorate has been a means by which men of independent means and good business capacity have found an outlet for their energies as well as a profitable occupation for their time. The railway secretary, again, is a man of many specialities, skilful in reading character, well-versed in affairs, acquainted with railway and general law, and familiar with the details of railway finance and the mysteries of the money market. These are the officials of the bureau, but the men who command in the field are not less important. The general manager and the traffic superintendent of a large railway must have many of the qualities of a military commander, supplemented by a patient endurance of detail, and a nice discrimination in all questions affecting speed, time, and distance.

Bradshaw is a study which confuses the traveller, but in the guide we only see passenger arrangements, while the "working time tables" the manager has to prepare include all trains. The construction of a table which shall provide for all the conflicting claims of expresses, ordinary passenger trains, fast goods traffic and heavy traffic, proceeding day and night over a busy line, demands a power of organisation little short of marvellous. And the same mind which constructs this great edifice of carefully fitted details is further responsible that the machinery he has devised shall

work smoothly, and, as far as possible, free from accident. The labours of the traffic manager must be seconded by the locomotive superintendent, who provides the stud of steam horses, large-wheeled and powerful for express speed, ponderous and strong of grip for heavy traffic, or light and easily handled for local passenger trains, as may be demanded. The carriage and waggon superintendent has the care of all other rolling stock, and his office is, in the larger railway systems, also a responsible and important one. To these might be added the names and occupations of many other officers who, either in some practical out-of-door work, as in the case of the telegraph superintendent, or in the discharge of valuable labours indoors such as the pay-clerk, the storekeeper, or the audit clerks, serve to keep in working order the vast organisation which a railway of the first rank calls into play.

THE STATION-MASTER.

More directly concerned with the public is the station-master, the local representative of his general-in-chief, the general manager. Within his own domain, a station-master is supreme. He is responsible for the orders of the generalissimo being properly carried out, for the proper despatch of trains, the marshalling of waggons in the goods yard, the preservation of discipline in his own little army, and of order

amongst the "many-headed," whose servant he is in one sense, but whose master he also is in an important respect. Although military precision and the habit of command are of the utmost value in a good station-master, it has not been found that a military man makes a good station-master. The best of the class probably rise from the ranks, or must at least have served in some capacity which has familiarised them with the requirements of the position. There are innumerable gradations in the ranks of the station-masters, from the man who commands a corporal's guard at a small roadside station, to one who holds the rank of a general of division, controlling an army at some great junction or metropolitan terminus. This diversity gives the railway company the fullest ground of choice, and the amplest means of promoting a good station-master, and in practice it is found to be one of the occupations which most truly obeys the maxim *palmarum qui meruit ferat*.

The booking-clerk, who ranks next to the station-master at the larger stations, affords in his title an evidence of the strongly conservative nature of mankind. A railway passenger is not "booked," as mail-coach passengers were, but buys a ticket from a ticket-clerk, and uses it or throws it in the fire, as may suit his fancy, for a train is like Artemus Ward's exhibition of Moral Wax Figures—you can't go in without paying, but you can pay without going in. Why should the little dungeon

where the tickets are sold to this day be called a "booking-office," and the lad who sells them a "booking-clerk"? So long as the sale of tickets has a close relation to the starting of each train, it is probably advantageous that the booking-clerk should have a wicket which he can shut down when no more tickets are to be issued. But when a better system prevails the ticket-office will be continuously open, or its counter will be open as in other public offices. The title of the officer who sells the tickets may then cease to preserve the memory of the time when the name of each passenger in a public conveyance was booked at the inn and entered on the way-bill of the coach. Within the "booking-office," at some of our larger stations, a clerk has sometimes as many as five thousand different kinds of tickets before him, in those simple yet elaborate cabinets in which the tickets are ranged. For every important station to which he can "book" passengers—the phrase will assert itself—he has first-class, second-class, third-class, parliamentary, return, and perhaps tourist or excursion tickets, including two or three classes of the two kinds last named. For every station, and each kind of ticket to that station, he has to remember the position of the tube in which the ticket lies, as well as the price of each ticket. He must be rapid in counting money and in giving out change, quick to detect bad or doubtful money, and prompt in

every action. The apparatus in which his tickets are arranged is an interesting structure, consisting of long upright tubes, in which the tickets are arranged in reversed numerical order. The tickets slope forward in the tube, and at the bottom is a slit by which one ticket at a time can be drawn out. When a booking-clerk has to make up his accounts after the despatch of each train he wants to know the number borne by the next unsold ticket in his tubes. To this is owing the practice of an exceedingly expert and almost invisible action of the fingers, by which, while the ticket to be sold is drawn wholly out, the next ticket is partially drawn out by another finger so as to show its number. Passing the ticket rapidly under the clip of the dating machine, the clerk pushes it over to the purchaser, draws in the money, pays away the change, if any, and turns to his next customer. Rapidity, exactness, memory, and good temper are demanded from the well-equipped booking-clerk, as well as scrupulous honesty. But it remains true that as a rule such clerks are poorly paid, and that they all look to better themselves, either in some other branch of the railway service or in some other walk in life. Such a phenomenon as an old booking-clerk is almost unknown.

THE PORTER.

While the station-master and booking-clerk, as petty officers, are

paid by salary, the wage-receiving class at the station, the rank and file of the sedentary railway army, includes the porter, the lamp-man, the goods-yard-man, the surface-man, and many other less prominent officials. The title of railway porter covers many occupations. He it is who dusts and washes the carriages after their journey is over, or couples them up and provides them with the necessary lamps, foot-warmers, signal cords, or other necessary appurtenances before their journey is begun. He receives and labels passengers' luggage for departing trains, calls cabs, and carries away luggage from arriving trains, and in general he may be designated as the servant of all work at a railway station. At the larger places the duties of the porters become divided into well-defined grades, but at a roadside station the man must literally be prepared, like the British army, to go anywhere and do anything. To the travelling public he fulfils the useful function of a ready and civil assistant, and if he is guilty of accepting "backsheesh," or even of looking for it as a means of supplementing his weekly earnings, the gift is freely given in recognition of such prompt, ready, and useful service as the porter is able to render to the weary traveller.

PLATELAYER AND SIGNALMAN.

The platelayer and the signalman come next in order, before we speak of the travelling officials—

the flying column of the railway force—who represent the guard and driver of the old coaching days. The signalman and the platelayer are more distinctly born of the railway system than the other railway servants named. The following notice of the labours of the platelayer, abridged from the *Railway News*, is interesting in bringing into notice the fact that one of the class has developed, in the solitude of his labours, no mean poetic power :—

"Hours before the daily tumult of railway life at its highest pressure has begun, and hours after it has ceased, there are silent men, with bags over their shoulders, walking along all the lines of the railways of the kingdom, carefully inspecting whether the rails, points, and everything belonging to the road are in good and proper condition. These men are the platelayers. It is the platelayer's duty to lay down new rails, or 'plates;' but another, equally if not more important, duty is to exercise a constant and never-ceasing watchfulness over the rails once laid down. To do this efficiently all railways are divided into districts, each of which has its 'gang' of platelayers, working under a foreman known as 'the ganger.' Near to railway junctions and in the neighbourhood of large towns, the districts embrace but a short length of line, often not a mile; but they are longer in the country, though seldom much more than two miles. Along the rails of this district the platelayer must

walk twice within every twenty-four hours, examining with the minutest care, under a habit of observation gained by long experience, whether everything is in good order. He has to see, more particularly, that all the keys and other fastenings which hold the rails to their bed are firm, and he must at the same time see to the state of the joints, marking any that may be defective. He has further to examine the line, level, and gauge of the road, and to look to the whole of the crossing, three-throw, and wire signals, oiling and cleaning the latter, and seeing whether they act properly. Little repairs that may be required the platelayer executes on the spot. He has in the bag that is slung over his shoulders a gauge, a keying-hammer, and spanners, as well as keys, nuts, and packings, and wonders in the way of staying small defects—which, though small, may cost precious lives if not attended to in time—may be done with the help of these limited resources. The platelayer, in fact, is the surgeon of the iron road—a man of importance, as none can doubt. That he is in general deeply imbued with the sense of the high responsibility is testified to by all railway managers. It is testified, too, in the utterances of a poetically-gifted member of the class in North Britain, who has written some really fine verses upon the iron road and the unacknowledged poetry of steam forces. The writer, a 'Railway Surfaceman,' *Anglicæ* platelayer,

thus sings, in a poem entitled, 'A Song of Labour':—

'Arm to arm, and let the metals into proper range be thrown,
Let us smooth the iron pathway to the monster coming on.
Lo ! he dawns adown the distance, and his iron footway rings
As he bounds, a wander'd meteor, muffled up in smoky wings—
Earth beneath his mighty footsteps trembles at the sudden load,
As of old the field Scamander at the falling of the god ;
Give him freedom, strength he needs not, only space and bound to fly,
As at night, in starry silence, glides a planet through the sky :
Thus he comes, the earth-born splendour, and with sudden shriek and gasp
On he flames, the Jove of Commerce, with the lightnings in his grasp.

Arm to arm, and let the metals, into proper range be thrown,
Let us shape the iron pathway for the monster coming on :
Make his footing sure and steady, fitting for a thing like him,
Rolling out his seven-leagued paces smoother than a bird can skim ;
Drawing city unto city, flinging with his grasp of steel
Nations into shape and method, till his muscles shake and reel ;
Stretching outward, like Briareus, hundred arms of sudden stroke,
Shooting upwards to the heavens coiling Laocoöns of smoke ;
Touching, like the gods of fable, all things into noble strife,
As before the heated sculptor flash'd the statue into life.'

"The strangely impressive lines of the Scottish Railway Surfaceman addressed to the flying locomotive—

'I think that he knows as he looks at me
That, though made of clay as I stand,
I could make him as weak as a three hours' child
With a paltry twitch of my hand,'—

indicate to a striking degree the sense of high responsibility which characterises, according to all reports, the veteran platelayer. He is deeply imbued with the fact, which indeed impresses itself upon him every hour of his working life, that to his constant untiring vigilance more than to that of almost any other class of railway servants, is left the safety of the trains that roll along over the iron highroad, and so this sense of vast responsibility is necessarily raised by the additional consciousness of imminent danger certain to arise from neglect of needful precautions. When repairing a portion of the line alone, or, as is usually done, in gangs, the platelayer must be, in the midst of all his work, constantly on the watch for coming trains, stepping quickly aside as they approach, and taking care while flying from one danger not to rush into another that may come from an opposite side. If working in a tunnel, and trains are approaching in both directions at once, the platelayer has to lie down between the two lines of way, carefully choosing the exact place of his berth on the cold ground, which becomes no easy matter when there are many men at work, who have to throw themselves down in a straight line, head to feet and feet to head. Discipline being of the utmost importance, the 'ganger' is invested with considerable authority. He has to see that, while the line is taken up for any extensive repairs, no train is coming near the place

of danger, for which purpose he is provided with danger signals and detonators, the latter placed a mile away at each side. To protect the coming train, as well as the work of the men under him, the 'ganger' must also send out, up and down the line, men with danger-signals, supplementing, if necessary, these outpost sentinels by others within a shorter distance. It is the uniform rule of all railway companies that the 'ganger' must walk over his district twice within twenty-four hours every week-day, and once every Sunday. His morning walk is usually before seven in the morning in summer, and before eight in winter, with corresponding hours in the evening. It may be imagined that while thus taking his solitary promenade along the rails while they are more or less deserted, tapping a rail here and there, adjusting keys and fastening points, the innate poetry of the silent iron road makes itself felt to the platelayer more than it does to other men in the railway service. He walks through a tunnel, dark and silent as the grave, not a sound revealing the existence of any living thing, when suddenly an engine and train thunder in upon him. The author of the 'Song of Labour' describes, evidently from experience, the impression produced by the sudden sight of the glaring firehorse :—

'Oh see how he shakes aside the night,
And roars in his thirsty wrath,
While his one great eye gleams white
with rage
At the darkness that muffles his path.'

Sights such as these are not granted to the ordinary traveller by railway, whom comfort shuts out from all disturbing sights and sounds, which is, perhaps, one of the reasons why the undeniable poetry of steam locomotion is not as yet generally admitted. So the world will have to wait for the coming poet-laureate of the rail, content, while waiting, with the not unworthy inspirations of a railway platelayer."

The onerous duty of the signalman grew out of small dimensions. When the Stockton and Darlington line was first used a candle in the station-house window was the signal for a train to stop, its absence an order for it to go on. The middle-aged person of the present day remembers a stage in advance of this, when a lamp-post with broad wings was the usual form of signal, having red glass in the side of the lamp parallel to the wings, and white in the side at right angles thereto. When the wings were visible the train must stop, but when they were turned round, so as to be edge-on to the coming train, the line was clear. In some cases there was an alternative wing, painted green, the signal for caution. The system has shown gradual improvement; till now the interior of the signal-cabin, at an important junction or large terminus, has come to be one of the most interesting mechanical combinations of our time. Except within stations, or at unimportant places, the "points" are no longer worked by hand, and

in the most approved apparatus there are interlocking points and signals, so arranged that when one line of rails is open by signal, every other line or cross-over leading into it is blocked as regards the signals, and locked as regards the points. In the first years of railway life, it may be here noticed, there were no "points," the changing from one line of rails to another being provided for by shunting the squared ends of the rails from one set to another. The operation is shown in several of Mr. Britton's views of the London and Birmingham Railway, published in 1839. By the adoption of the present system of points the facility of passing trains from one line of rails to another was much increased, and, by the introduction of the signal-cabin, with its levers controlling at once the points and signals, the working of a railway has been rendered at once more simple and more safe. The introduction of the "block telegraph system" has tended to increase the importance of the signalman, while it has also rendered railway travelling safer than before. Under the block system a railway is divided into portions or "blocks," each one of which must be commanded by a signal-cabin, and in any one of which there must be but one train at a time on the same line of rails. Being connected by telegraph, the traffic is conducted by signals from one cabin to the other, and very finely contrived apparatus has been invented to simplify and render

secure the working of the system. Before the signalman in one box can permit a train to pass into the block he commands, he must have got from the next box the notice "line clear;" and when he gets the signal "train on line" from the block-house in the other direction he must not send "line clear" till the train has passed his box and entered the next block. Where traffic is incessant the blocks are short, and the closeness of the signal-boxes enables a large business to be safely worked. As the line stretches away into the country the blocks are made larger; but, whether large or small, the signalman has the great principle always to keep in view, that no train shall pass his box till he has got the signal that the line it is to enter upon is clear. Where, in one signal-box, the lines of rails commanded are counted by the dozen, and the trains passing daily are counted by the hundred, the duty of the signalman is one that demands unceasing vigilance, a retentive memory, a strong hand, and unflinching devotion to duty. To the firmness and watchfulness of the signalman, no less than to the care and judgment of the surfaceman, the safe conduct of our millions of railway passengers is primarily due.

ENGINE-DRIVER AND GUARD.

Upon the train itself, the driver and the fireman upon the engine, and the guard or conductor in the van, are the heirs and representatives of the old driver and guard.

There is no special seat on the box next the driver to which horsey or gossip travellers may aspire, and the sound of the cheery horn of the guard is replaced by the wave of a hand or the slight whistle which signals to the driver that he may proceed on his journey. There is infinitely less social intercourse now between the officials of the train and its occupants than in the olden days of travelling, and there is a popular idea that drivers are a misanthropic race compared with the Jehus they have displaced. A good driver must certainly be a thoughtful, self-contained man, conscious of the importance of the duty lying on him as he flies through the air on his fire-horse at a speed only rivalled, as it has been said, by that of a cannon ball. The fireman is a driver in training, though it does not always follow that he succeeds to that office. The "guard" is in some respects misnamed, and he might be called the parcel clerk or luggage inspector for the train. However, he has some well-defined functions in controlling the movements of the train and in assisting the driver to bring it safely to its journey's end. The natty uniform of the guard generally encases a strong and healthy frame, bearded, as most outdoor railway servants now are, generally amiable in expression and civil in manner. The long periods over which drivers and guards continue their services show their occupation to be a very healthy one.

INDEX.

ACCIDENTS, coach, 132, 173; railway, 595.
American "Lightning" train, 585; river steamers, 448; Spider phaeton, 139; train newspaper, 586; trestle bridges, 544.

Andes, human beasts of burden on, 23.
Atlantic voyages—first, 387; incidents of, 429; quick, 418; terrible, 437.
Automaton model carriage, 124.

BARTON Aqueduct, wonder excited by, 285.
Barouche, introduced, 81; pleasantest of land carriages, 102; in Paris, 139.
Bell, Henry, builds the "Comet," 367.
Berline, Baroness Korff's, 114; Introduction of, 81.

Bhore Ghaut Incline, 550.
Bianconi's cars, 235; car-drivers, 242; extent, 238; effect of railways on, 240.
Bill of fare on Atlantic steamer, 432; at railway station, 590.

"Birkenhead," loss of the, 445.
Block signals and interlocking points, 605.

"Bodkin" riding, 163.
Brindley, James, 282; his first canal, 285.
Britannia Bridge, 528.

Brouette or wheeled chair, 54.
Brougham, 140.
Brundisium, voyage of Horace to, 273.
Buckingham introduces Sedan chairs, 22

CALEDONIAN Canal, 320.
Canadian Pacific Railway, 572.
Canal barges, existing passenger, 818.
Canal du Midi, 278.

Canals, advantages of, 294; Chinese, 273; dangers of, 316; early European, 277; early British, 281; historical notice of, 271; Irish, 299; locks, 275; mentioned by Horace, 273; Scottish, 296; results of, 302; ship, 320; steam on, 307; tunnels, 293.

Canal travelling, amenities, 311; dangers, 316; scenery, 315; speed, 307.

Canterbury and Whitstable Railway, 497.
Carriage with sails, 130; drawn by kites, 132.

Carriole of Norway, 139.
Chairmen of Edinburgh, 89; nationality, 30; tipsy, 29.

Chaises à porteur, 22.
Channel tunnel, 541.
Char-à-côté of Switzerland, 139.
Chariots, ancient British, 59; in Paris, 139.

Char-Volant, 132
Chat Moss, 514.
Chepstow Bridge, 515.
Chinese sedan chairs, 43.

Clarinda, 33; courted in stage coach, 171.
Cleveland, Duke of, opposes railways, in 1825, 464; at railway jubilee 1875, 489.
Coaching, revival of, 266; club, 262.
Coachman's account for outlays, 84.

Coaches, dangers of, 99; earliest, notices of, 57; etymology of name, 59; famous, 113; fanciful, 127; in eighteenth century, 75; in Paris, 64; in Scotland, 82; in Spain, 63; introduction into Britain, 65; legislation for, 69, 78; required many attendants, 81; pleasures of, 99, 208; physicians, 80; opposition to, 64; shot-proof, 175; use forbidden, 68.

Cologne railway bridge, 551.
"Comet," the, 367; relics of, 870.
Cou-cou, described, 177; passengers in 170.
Crumlin Viaduct, 546.

DARLING, Grace, and the "Forfarshire," 443.
Derby Dilly, 168.
Désobligeant described by Sterne, 82.
Dog-carts, 140.
Drag, 139.
Du Val, adventure with, 110.

EBRO, bridge over the, 550.
Edinburgh and London glass-coach, 160.
Euston Station, 526.

FLYING coaches, 158.
Forth and Clyde Canal, 297, 322.
Four-in-hand Club, 259.
Fulton, Robert, inspects Symington's vessel, 360; builds first American steamer, 363.

GALERA, 178.
George III., state carriage of, 122.
"Great Britain" steamship, 393; "Great Eastern," 396; "Great Western," 389.
Grumbling travellers, 253.
Guard, mail, 229; railway, 606.

HAWES Fly, 164.
High-flyer, 127.
Highwaymen, 109, 178.
Hogarth's five days' peregrination, 845.
Hollandsch-Diep, Bridge, 551.
Horse-litters, 21.
Hotel Cluny, state carriages at, 117.
"Hoy," the passenger, 345.
Huskisson, Mr., death of, 485.

INDIA, railways in, 557; railway to, 564.
Infernal machine, 125.
Inns and hotels, 244; laws affecting, 255.
Inter-colonial railway, 572.
Ireland, canals, 299; cars, 140, 235; hotels, 252; mail coaches, 231; railways, 554.

JAPANESE sedan chairs, 49.
Jin-riki-sha, or Japanese wheeled chair, 50.
Johnson, Dr., on travelling by post-chaise, 99; by ship, 344.

KORFF BERLINE, 114.

LECTICA EQUESTRE, or horse litters, 21.
Liverpool and Manchester Railway, 480.
Locks, invention of canal, 275.
Locomotive, earliest, 458; competition in 1829, 482.
Love in a stage coach, 171.

MACLAREN, Charles, on railways, 497, 504, 579.

Mail coach, 181; driver, 224; guard, 229; maxims for travellers by, 209; miseries of, 218; pleasures of, 208; reforms by Mr. Palmer, 190.

Mail phaetons, 140.

Marine engines, changes in form, 420.

Miller, Patrick, of Dalswinton, 354.

Mont Cenis Tunnel, 536.

NAPIER, David, 376.

National vehicles, various, 137.

Niagara Suspension Bridge, 534.

Noddy, the Irish, 135.

North Sea Canal, 324.

OPPOSITION to mail coaches, 198; to railways, 489, 492; to sedan chairs, 29; to stage coaches, 150.

Outside passengers, 218.

Overland route, 410.

PALMER, Mr., mail coach reforms of, 190.

Parisian coaches, 64; cabriolets, 139.

Pease, Edward, promoter of Stockton and Darlington, 464; interview with George Stephenson, 467.

Perambulator, 141.

Post-office, history of, 182.

Press, opposition to railways, 492.

Prince Consort, waggonette introduced by, 140.

Pullman cars, 591.

QUEEN Elizabeth, coach of, 67.

Queen Victoria, carriages at coronation of, 125.

RAILWAY Acts before 1825, 463; booking clerk, 600; engine-driver, 606; first accident on, 485; guard, 606; opening of first, 469; platelayer, 602; porter, 601; refreshment room, 587; speed on, 583; signalman, 602; station-master, 600; to India, 564.

Railways in British Empire, 556; Canada, 572; Far East, 576; Great Britain, 554; India, 557; the world, 574; in seventeenth and eighteenth centuries, 454; revenue and traffic on British, 555.

Rheda caballaria, 21.

"Road game," 223.

Roads, in sixteenth century, 68; in eighteenth century, 85, 89; in Scotland, 95.

"Rocket," the, made by Stephenson, 482.

Roman canals in Britain, 280.

Roulette, or wheeled sedan, 54.

Rufus, William, horse chariot of, 21.

Ruskin, John, on railways, 487, 579.

Russel, Alexander, supports Suez Canal, 329; his description of opening, 384.

"SAVANNAH" crosses Atlantic, 387-388.

Saxons, coaches among the, 59.

Scarborough and Bridlington coach, 265.

Scotland, canals, 296; coaches in Highlands, 82; stage coaches, 149; first locomotive railway, 479; posts, 189; roads, 95.

Screw propeller, invention of, 421.

Sedan chairs, Chinese, 43; existing, 41; first used in Britain, 22; fares in eighteenth century, 35; in nineteenth century, 40; form in seventeenth century, 25; in eighteenth century, 27; introduction and early use, 19; Japanese, 49; modern, 37; prisoners in, 35; objections to, 27.

Ship canals, 320.

Shot-proof coaches, 175.

"Sirius" crosses Atlantic, 389.

South Devon Viaducts, 533.

Speed of carriage, 90; jin-riki-sha, 50; mail coach, 199; early stage coach, 149; on canal, 307; on railway, 583.

Stage coach, a microcosm, 169; dangers, 172; first, 146⁴ first in Britain, 149; French, 177; objections to, 150; occupants of, 154; without oil, 161.

Stage waggon, 146.

State carriages, British Royal, 122; existing ancient, 117; Lord Mayor's, 120; Oriental, 124; Washington's, 116.

Steamers, American river, 448; comfort of, 384; dangers, 427; deep sea, 376; first American, 363; first iron, 407; first sea-going, 373; form and size, 394; ironclad, 461; pleasures of, 427.

Steam navigation, first essays in, 347; general progress of, 400.

Steamship Company, Cunard, 413; "P. and O.," 411; Royal Mail, 412.

Stockton and Darlington Railway, 464; opening, 469; used for passengers, 476; opposition to, 464.

Strathpeffer coach, 269.

Suez Canal, 329; opening of, 384.

Symington, William, 354.

"TABARD" inn at Southwark, 244.

Tarantas of Russia, 137.

Tay Bridge, 544.

Thames subway, 525.

Traffic and revenue of British railways, 555.

Tunnel, Channel, 541; Kilsby, 527; Mont Cenis, 536; Thames, 516; Watford, 527; tunnels on canals, 293.

UNION Canal, 297.

VICTORIA Bridge, St. Lawrence, 534.

Vinaigrette or wheeled sedan, 54.

WADE, General, epitaph on, 96.

Waggonette introduced by Prince Consort, 140.

Wheeled sedan chair, 54; in Japan, 49.

A SELECTION FROM CATALOGUE
OF
Popular and Standard Books
PUBLISHED BY
WILLIAM P. NIMMO, LONDON AND EDINBURGH.

~~~~~  
\* \* Complete Catalogue of Mr. NIMMO's Publications, choicely printed and elegantly bound, suitable for the Library, Presentation, and School Prizes, etc. etc., will be forwarded gratis, post free, on application.

~~~~~  
'Mr. Nimmo's books are well known as marvels of cheapness, elegance, and sterling worth.'—OBSERVER.

—o—
NIMMO'S POPULAR EDITION
OF
THE WORKS OF THE POETS.

—o—
In fcap. 8vo, printed on toned paper, elegantly bound in cloth extra, with beautifully illuminated imitation Ivory tablet on side, price 3s. 6d.; also kept in cloth extra, gilt edges, without tablet; in fine morocco, plain, price 7s. 6d.; also in Caledonian wood, fern pattern, with Photo. Portrait, etc., on side, morocco extra back, price 10s. Each Volume contains a Memoir, and is illustrated with a Portrait of the Author engraved on Steel, and numerous full-page Illustrations on Wood, from designs by eminent Artists; also beautiful Illuminated Title-page.

- ~~~~~
1. LONGFELLOW'S POETICAL WORKS.
2. SCOTT'S POETICAL WORKS.
3. BYRON'S POETICAL WORKS.
4. MOORE'S POETICAL WORKS.
5. WORDSWORTH'S POETICAL WORKS.

[Continued on next page]

**NIMMO'S POPULAR EDITION OF THE
WORKS OF THE POETS,
CONTINUED.**



6. COWPER'S POETICAL WORKS.
7. MILTON'S POETICAL WORKS.
8. THOMSON'S POETICAL WORKS.
9. GOLDSMITH'S CHOICE WORKS.
10. POPE'S POETICAL WORKS.
11. BURNS' POETICAL WORKS.
12. THE CASQUET OF GEMS. Choice Selections
from the Poets.
13. THE BOOK OF HUMOROUS POETRY.
14. BALLADS: Scottish and English.
15. BUNYAN'S PILGRIM'S PROGRESS AND
HOLY WAR.
16. LIVES OF THE BRITISH POETS.
17. THE PROSE WORKS OF ROBERT BURNS.
18. POEMS, SONGS, AND BALLADS OF THE
SEA.

~~~~~

\* \* This Series of Books, from the very superior manner in which it is produced, is at once the cheapest and handsomest edition of the Poets in the market. The volumes form elegant and appropriate Presents as School Prizes and Gift-Books, either in cloth or morocco.

\* They are a marvel of cheapness, some of the volumes extending to as many as 700, and even 900, pages, printed on toned paper in a beautifully clear type. Add to this, that they are profusely illustrated with wood engravings, are elegantly and tastefully bound, and that they are published at 3s. 6d. each, and our recommendation of them is complete."—*Scotsman*.

---

## NIMMO'S SELECT LIBRARY.

---

*New Series of Choice Books, beautifully printed on superfine paper, profusely Illustrated with original Engravings by the first Artists, and elegantly bound in cloth extra, plain edges, price 3s. 6d. each, or richly bound in cloth and gold, and gilt edges, price 5s. each.*

1. **Almost Faultless : A Story of the Present Day.** By the Author of 'A Book for Governesses.'
2. **Lives of Old English Worthies before the Conquest.** By W. H. DAVENPORT ADAMS.
3. **Every-Day Objects ; or, Picturesque Aspects of Natural History.** By W. H. DAVENPORT ADAMS.
4. **My Schoolboy Friends : A Story of Whitminster Grammar School.** By ASCOTT R. HOPE, Author of 'A Book about Dominies,' 'Stories of School Life,' etc.
5. **Drifted and Sifted : A Domestic Chronicle of the Seventeenth Century.**
6. **Warrior, Priest, and Statesman ; or, English Heroes in the Thirteenth Century.** By W. H. DAVENPORT ADAMS.
7. **Totty Testudo. The Life and Wonderful Adventures of Totty Testudo.** An Autobiography by FLORA F. WYLDE.
8. **On Holy Ground ; or, Scenes and Incidents in the Land of Promise.** By EDWIN HODDER, Author of 'Memories of New Zealand Life,' 'The Junior Clerk,' etc.

---

## NIMMO'S CROWN GIFT BOOKS.

---

*Crown 8vo, beautifully printed on superfine paper, profusely Illustrated by eminent Artists, in cloth extra, plain edges, price 3s. 6d. each, or richly bound in cloth and gold, and gilt edges, price 5s. each.*

1. **Sword and Pen ; or, English Worthies in the Reign of Elizabeth.** By W. H. DAVENPORT ADAMS.
2. **Norrie Seton ; or, Driven to Sea.** By Mrs. George Cupples, Author of 'Unexpected Pleasures,' etc.
3. **The Circle of the Year ; or, Studies of Nature and Pictures of the Seasons.** By W. H. DAVENPORT ADAMS.
4. **The Wealth of Nature : Our Food Supplies from the Vegetable Kingdom.** By the Rev. JOHN MONTGOMERY, A.M.
5. **Stories of School Life.** By ASCOTT R. HOPE.
6. **Stories of French School Life.** By ASCOTT R. HOPE.

## NIMMO'S UNIVERSAL GIFT BOOKS.

*A Series of excellent Works, profusely Illustrated with original Engravings by the first Artists, choicely printed on superfine paper, and elegantly bound in cloth and gold, and gilt edges, crown 8vo, price 3s. 6d. each.*

1. **Tales of Old English Life ; or, Pictures of the Periods.**  
By WILLIAM FRANCIS COLLIER, LL.D., Author of 'History of English Literature,' etc.
2. **Mungo Park's Life and Travels.** With a Supplementary Chapter, detailing the results of recent Discovery in Africa.
3. **Benjamin Franklin : A Biography.** From the celebrated 'Life' by JARED SPARKS, and the more recent and extensive 'Life and Times' by JAMES PARTON.
4. **Wallace, the Hero of Scotland: A Biography.** By JAMES PATTERSON.
5. **Men of History. By Eminent Writers.**  
\* \* The object of the Editor in preparing this book for the public is a twofold one: first, to exhibit views of the world's great men; and, second, to present these views in the best words of the best authors.
6. **Women of History. By Eminent Writers.**  
\* \* This volume is a further development of the idea which suggested the companion volume, 'Men of History.'
7. **Old-World Worthies ; or, Classical Biography.** Selected from PLUTARCH'S LIVES.
8. **Epoch Men, and the Results of their Lives.** By Samuel NEIL.
9. **The Mirror of Character.** Selected from the Writings of OVERBURY, EARLE, and BUTLER.
10. **The Improvement of the Mind.** By Isaac Watts, D.D.
11. **The Man of Business considered in Six Aspects.** A Book for Young Men.

\* \* This elegant and useful Series of Books has been specially prepared for School and College Prizes: they are, however, equally suitable for General Presentation. In selecting the works for this Series, the aim of the Publisher has been to produce books of a permanent value, interesting in manner and instructive in matter—books that youth will read eagerly and with profit, and which will be found equally attractive in after-life.

**NIMMO'S ALL THE YEAR ROUND GIFT BOOKS.**

*A series of entertaining and instructive volumes, profusely Illustrated with original Engravings by the first Artists, choicely printed on superfine paper, and elegantly bound in cloth and gold, and gilt edges, crown 8vo, price 3s. 6d. each.*

1. Round the Grange Farm; or, Good Old Times. By JEAN L. WATSON, Author of 'Bygone Days in our Village,' etc.
2. Stories about Boys. By ASCOTT R. HOPE, Author of 'Stories of School Life,' 'My Schoolboy Friends,' etc. etc.
3. George's Enemies: A Sequel to 'My Schoolboy Friends.' By ASCOTT R. HOPE, Author of 'Stories about Boys,' etc.
4. The Spanish Inquisition: Its Heroes and Martyrs. By JANET GORDON, Author of 'Champions of the Reformation,' etc.
5. Wild Animals and Birds: Curious and Instructive Stories about their Habits and Sagacity. With numerous Illustrations by WOLF, the eminent Artist.
6. Rupert Rochester, the Banker's Son. A Tale. By WINIFRED TAYLOR, Author of 'Story of Two Lives,' etc.
7. The Young Mountaineer; or, Frank Miller's Lot in Life. The Story of a Swiss Boy. By DARYL HOLME.
8. The Story of a Noble Life; or, Zurich and its Reformer Ulric Zwingle. By Mrs. HARDY (JANET GORDON), Author of 'The Spanish Inquisition,' etc.
9. Stories of Whitminster. By ASCOTT R. HOPE, Author of 'My Schoolboy Friends,' etc.
10. The Pampas: A Story of Adventure in the Argentine Republic. By A. R. HOPE, Author of 'Stories of Whitminster,' etc. *Illustrated by Phiz, Junior.*
11. The Tower on the Tor. By Richard Rowe, Author of 'Episodes in an Obscure Life,' 'The Boys of Axleford,' 'Jack Afloat and Ashore,' etc.

\* \* The object steadily kept in view in preparing the above series has been to give a collection of works of a thoroughly healthy moral tone, agreeably blending entertainment and instruction. It is believed this end has been attained, and that the several volumes will be found eminently suitable as Gift Books and School Prizes, besides proving of permanent value in the Home Library.

**NIMMO'S YOUNG LADIES' LIBRARY.**

~~~~~

A series of entertaining and instructive volumes, written with a high purpose, and of a good moral tone, profusely illustrated with original Engravings by the first Artists, choicely printed on superfine paper, and elegantly bound in cloth and gold, and gilt edges, crown 8vo, price 3s. 6d. each.

1. **Violet Rivers ; or, Loyal to Duty. A Tale for Girls.**
By WINIFRED TAYLOR, Author of 'Story of Two Lives,' etc.
2. **Christian Ostorne's Friends. By Mrs. Harriet Miller**
DAVIDSON, Author of 'Isobel Jardine's History,' and Daughter of the late Hugh Miller.
3. **The Twins of Saint-Marcel: A Tale of Paris Incendie.**
By Mrs. A. S. ORR, Author of 'The Roseville Family,' etc.
4. **The Story of Two Lives ; or, The Trials of Wealth and Poverty.** By WINIFRED TAYLOR, Author of 'Rupert Rochester,' etc.
5. **The Lost Father ; or, Cecilia's Triumph. A Story of our own Day.** By DARYL HOLME.
6. **Friendly Fairies ; or, Once upon a Time.**
7. **Wisdom, Wit, and Allegory. Selected from 'The Spectator.'**
8. **Stories from over the Sea. With Illustrations.**
9. **Heroes of Ancient Greece: A Story of the Days of Socrates the Athenian.** By ELLEN PALMER, Author of the 'Fishermen of Galilee,' 'The Standard Bearer,' etc.
10. **The Farm on the Fjord. A Tale of Life in Norway.** By CATHERINE RAY.

NIMMO'S HALF-CROWN REWARD BOOKS.

Extra foolscap 8vo, cloth elegant, gilt edges, Illustrated,
price 2s. 6d. each.

1. **Memorable Wars of Scotland.** By Patrick Fraser Tytler, F.R.S.E., Author of 'The History of Scotland,' etc.
2. **Seeing the World: A Young Sailor's own Story.** By CHARLES NORDHOFF, Author of 'The Young Man-of-War's-Man.'
3. **The Martyr Missionary: Five Years in China.** By Rev. CHARLES P. BUSH, M.A.
4. **My New Home: A Woman's Diary.**
5. **Home Heroines: Tales for Girls.** By T. S. Arthur, Author of 'Life's Crosses,' etc.
6. **Lessons from Women's Lives.** By Sarah J. Hale.
7. **The Roseville Family. A Historical Tale of the Eighteenth Century.** By Mrs. A. S. ORR, Author of 'Mountain Patriots,' etc.
8. **Leah. A Tale of Ancient Palestine. Illustrative of the Story of Naaman the Syrian.** By Mrs. A. S. ORR.
9. **Champions of the Reformation: The Stories of their Lives.** By JANET GORDON.
10. **The History of Two Wanderers; or, Cast Adrift.**
11. **The Vicar of Wakefield.** By Oliver Goldsmith.
12. **The Miner's Son, and Margaret Vernon.** By M. M. POLLARD, Author of 'The Minister's Daughter,' etc. etc.
13. **How Frank began to Climb the Ladder, and the Friends who lent him a hand.** By CHARLES BRUCE, Author of 'Lame Felix,' etc.
14. **Conrad and Columbine. A Fairy Tale.** By James MASON.
15. **Aunt Ann's Stories.** Edited by Louisa Loughborough.
16. **The Snow-Sweepers' Party, and the Tale of Old Tubbins.** By R. ST. JOHN CORBET, Author of 'Mince Pie Island,' etc. etc.
17. **The Story of Elise Marcel. A Tale for Girls.**
18. **A Child's Corner Book: Stories for Boys and Girls.** By RICHARD ROWE, Author of 'Episodes in an Obscure Life,' 'Jack Afloat and Ashore,' etc.
19. **The Lucky Bag: Stories for the Young.** By Richard ROWE, Author of 'The Tower on the Tor,' etc.

NIMMO'S HOME AND SCHOOL REWARD BOOKS.

*Foolscap 8vo, Illustrated, elegantly bound in cloth extra, bevelled boards,
gilt back and side, gilt edges, price 2s. each.*

1. **Guiding Lights: Lives of the Great and Good.** By F. E. COOKE, Author of 'Footprints.'
2. **Heroes of Charity: Records from the Lives of Merciful Men** whose Righteousness has not been Forgotten. By JAMES F. COBB, F.R.G.S., Author of 'Stories of Success,' etc.
3. **Afloat and Ashore with Sir Walter Raleigh.** By Mrs. HARDY (JANET GORDON), Author of 'Champions of the Reformation,' etc.
4. **Philip Walton; or, Light at Last.** By the Author of 'Meta Franz,' etc.
5. **The Standard-Bearer.** A Tale of the Times of Constantine the Great. By ELLEN PALMER.
6. **Mountain Patriots.** A Tale of the Reformation in Savoy. By Mrs. A. S. ORR.
7. **Picture Lessons by the Divine Teacher; or, 'Illustrations of the Parables of our Lord.** By PETER GRANT, D.D.
8. **Taken up: A Tale for Boys and Girls.** By Alfred Whymper.
9. **Stories told in a Fisherman's Cottage.** By Ellen Palmer, Author of 'The Standard-Bearer,' etc. etc.
10. **Diversions of Hollycot; or, The Mother's Art of Thinking.** By Mrs. JOHNSTONE, Author of 'Nights of the Round Table,' etc.

NIMMO'S BOYS' OWN LIBRARY.

*Foolscap 8vo, Illustrated, elegantly bound in cloth extra, bevelled boards,
gilt back and side, gilt edges, price 2s. each.*

1. **The Far North: Explorations in the Arctic Regions.** By ELISHA KENT KANE, M.D.
2. **Great Men of European History.** From the Beginning of the Christian Era till the Present Time. By DAVID PRYDE, M.A.
3. **The Young Men of the Bible.** A Series of Papers, Biographical and Suggestive. By Rev. JOSEPH A. COLLIER.
4. **The Blade and the Ear: A Book for Young Men.**
5. **Monarchs of Ocean: Columbus and Cook.**
6. **Lame Felix.** A Book for Boys. By Charles Bruce.
7. **Life at Hartwell; or, Frank and his Friends.** By Katharine E. MAY, Author of 'Alfred and his Mother,' etc. etc.
8. **Max Wild, the Merchant's Son; and other Stories for the Young.**
9. **Noble Mottoes: Familiar Talks with Peter Glenville on the Mottoes of Great Families.** By CHARLES BRUCE, Author of 'Lame Felix,' etc.
10. **The Castaway's Home; or, the Story of the Sailing and the Sinking of the Good Ship 'Rose.'** By Mrs. HARDY (JANET GORDON), Author of 'Afloat and Ashore with Sir Walter Raleigh,' etc.

NIMMO'S.
TWO SHILLING LIBRARY FOR GIRLS.

Foolscap 8vo, Illustrated, elegantly bound in cloth extra, bevelled boards, gilt back and side, gilt edges, price 2s. each.

1. **Life's Crosses, and How to Meet them.** Tales for Girls. By T. S. ARTHUR.
2. **A Father's Legacy to his Daughters, etc.** A Book for Young Women. By DR. GREGORY.
3. **Labours of Love: A Tale for the Young.** By Winifred Taylor.
4. **Mossdale: A Tale for the Young.** By Anna M. De Iongh.
5. **Jacqueline.** A Story of the Reformation in Holland. By MRS. HARDY (JANET GORDON).
6. **The Minister's Daughter, and Old Anthony's Will.** Tales for the Young. By M. M. POLLARD.
7. **The Two Sisters.** By M. M. POLLARD.
8. **A Needle and Thread: A Tale for Girls.** By Emma J. Barnes, Author of 'Faithful and True, or the Mother's Legacy.'
9. **Nonna: A Story of the Days of Julian the Apostate.** By Ellen PALMER.
10. **An Earl's Daughter.** A Story for the Young. By M. M. POLLARD, Author of 'The Two Sisters,' etc. etc.
11. **Doing and Dreaming.** A Tale for the Young. By Edward GARRETT, Author of 'Occupations of a Retired Life,' 'Crooked Places,' 'By Still Waters,' etc.

NIMMO'S
Sunday-School Reward Books.

Foolscap 8vo, cloth extra, gilt edges, Illustrated, price 1s. 6d. each.

1. **Bible Blessings.** By Rev. Richard Newton.
2. **One Hour a Week: Fifty-two Bible Lessons for the Young.**
3. **The Best Things.** By Rev. Richard Newton.
4. **The Story of John Heywood: A Tale of the Time of Harry VIII.** By CHARLES BRUCE, Author of 'How Frank began to Climb,' etc.
5. **Lessons from Rose Hill; and Little Nannette.**
6. **Great and Good Women: Biographies for Girls.** By LYDIA H. SIGOURNEY.
7. **At Home and Abroad; or, Uncle William's Adventures.**
8. **Alfred and his Mother; or, Seeking the Kingdom.** By KATHARINE E. MAY.
9. **Asriel; or, The Crystal Cup.** By Mrs. Henderson.
10. **The Kind Governess; or, How to make Home Happy.**
11. **Percy and Ida.** By Katharine E. May.
12. **Three Wet Sundays with the Book of Joshua.** By Ellen PALMER, Author of 'Christmas at the Beacon,' etc. etc.
13. **The Fishermen of Galilee; or, Sunday Talks with Papa.** By ELLEN PALMER.

Nimmo's Sunday and Week-Day Reward Books.

Foolscap 8vo, cloth extra, gilt edges, Illustrated, price 1s. 6d. each.

1. **The Sculptor of Bruges.** By Mrs. W. G. Hall.
2. **From Cottage to Castle; or, Faithful in Little.** A Tale founded on Fact. By M. H., Author of 'The Red Velvet Bible,' etc.
3. **Christmas at the Beacon.** By Ellen Palmer.
4. **The Sea and the Savages.** By Harold Lincoln.
5. **The Swedish Singer; or, The Story of Vanda Rosendahl.** By Mrs. W. G. Hall.
6. **My Beautiful Home; or, Lily's Search.** By Chas. Bruce.
7. **The Story of a Moss Rose.** By Charles Bruce.
8. **Summer Holidays at Silversea.** By E. Rosalie Salmon.
9. **Fred Graham's Resolve.** By the Author of 'Mat and Sofie.'
10. **Wilton School; or, Harry Campbell's Revenge.** A Tale. By F. E. WEATHERLY.
11. **Grace Harvey and her Cousins.**
12. **Blind Mercy; and other Tales.** By Gertrude Crockford.
13. **Evan Lindsay.** By Margaret Fraser Tytler, Author of 'Tales of Good and Great Kings,' 'Tales of the Great and Brave,' etc.
14. **Harvey Sinclair; or, a Lesson for Life.** By the Author of 'Mat and Sofie,' 'Fred Graham's Resolve.'
15. **The Boys of Willoughby School: A Tale.** By Robert RICHARDSON, B.A., Author of 'The Cold Shoulder,' etc.

Nimmo's One Shilling Favourite Reward Books.

Demy 18mo, Illustrated, cloth extra, price 1s. each; also in gilt side and edges, price 1s. 6d. each.

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. The Vicar of Wakefield. Poems and Essays. By OLIVER GOLDSMITH. 2. Æsop's Fables, with Instructive Applications. By Dr. CROXALL. 3. Bunyan's Pilgrim's Progress. 4. The Young Man-of-War's-Man: A Boy's Voyage round the World. By CHARLES NORDHOFF. 5. The Treasury of Anecdote: Moral and Religious. 6. The Boy's Own Workshop; or, The Young Carpenters. By JACOB ABBOTT. 7. The Life and Adventures of Robinson Crusoe. 8. The History of Sandford and Merton. A Moral and Instructive Lesson for Young Persons. | <ol style="list-style-type: none"> 9. Evenings at Home; or, The Juvenile Budget Opened. Consisting of a variety of Miscellaneous Pieces for the Instruction and Amusement of Young Persons. By Dr. AIKIN and Mrs. BARBAULD. 10. Unexpected Pleasures; or, Left alone in the Holidays. By Mrs. GEORGE CUPPLES, Author of 'Norrie Seton,' etc. 11. The Beauties of Shakespeare. With a General Index by the Rev. WILLIAM DODD, LL.D. 12. Gems from 'The Spectator.' A Selection from the most admired Writings of Addison and Steele. 13. Burns' Poetical Works. With a Complete Glossary. 14. The Sketch Book. By WASHINGTON IRVING. |
|---|---|

*** The above Series of elegant and useful books is specially prepared for the entertainment and instruction of young persons.

NIMMO'S ONE SHILLING ILLUSTRATED JUVENILE BOOKS.

**Folscap 8vo, Coloured Frontispieces, handsomely bound in cloth,
Illuminated, price 1s. each.**

- 1. Four Little People and their Friends.**
- 2. Elizabeth; or, The Exiles of Siberia. A Tale**
from the French of Madame COTTIN.
- 3. Paul and Virginia. From the French of**
BERNARDIN SAINT-PIERRE.
- 4. Little Threads: Tangle Thread, Golden**
Thread, and Silver Thread.
- 5. Benjamin Franklin, the Printer Boy.**
- 6. Barton Todd, and The Young Lawyer.**
- 7. The Perils of Greatness: The Story of Alex-**
ander Menzikoff.
- 8. Little Crowns, and How to Win them. By**
Rev. JOSEPH A. COMLIER.
- 9. Great Riches: Nelly Rivers' Story. By Aunt**
FANNY.
- 10. The Right Way, and The Contrast.**
- 11. The Daisy's First Winter. And other Stories.**
By HARRIET BEECHER STOWE.
- 12. The Man of the Mountain. And other**
Stories.
- 13. Better than Rubies. Stories for the Young,**
Illustrative of Familiar Proverbs. With 62 Illustrations.
- 14. Experience Teaches. And other Stories for**
the Young, Illustrative of Familiar Proverbs. With 39 Illus-
trations.

[Continued on next page.]

**NIMMO'S ONE SHILLING ILLUSTRATED
JUVENILE BOOKS,**
CONTINUED.

15. **The Happy Recovery.** And other Stories for the Young. With 26 Illustrations.
16. **Gratitude and Probity.** And other Stories for the Young. With 21 Illustrations.
17. **The Two Brothers.** And other Stories for the Young. With 13 Illustrations.
18. **The Young Orator.** And other Stories for the Young. With 9 Illustrations.
19. **Simple Stories to Amuse and Instruct Young Readers.** With Illustrations.
20. **The Three Friends.** And other Stories for the Young. With Illustrations.
21. **Sybil's Sacrifice.** And other Stories for the Young. With 12 Illustrations.
22. **The Old Shepherd.** And other Stories for the Young. With Illustrations.
23. **The Young Officer.** And other Stories for the Young. With Illustrations.
24. **The False Heir.** And other Stories for the Young. With Illustrations.
25. **The Old Farmhouse; or, Alice Morton's Home.** And other Stories. By M. M. POLLARD.
26. **Twyford Hall; or, Rosa's Christmas Dinner,** and what she did with it. By CHARLES BRUCE.
27. **The Discontented Weathercock.** And other Stories for Children. By M. JONES.
28. **Out at Sea, and other Stories.** By Two Authors.
29. **The Story of Waterloo; or, The Fall of NAPOLEON.**
30. **Sister Jane's Little Stories.** Edited by Louisa LOUGHBOROUGH.
31. **Uncle John's First Shipwreck; or, the Loss of the Brig 'Nellie.'** By CHARLES BRUCE, Author of 'Noble Mottoes, etc.

NIMMO'S NINEPENNY SERIES FOR BOYS AND GIRLS.

In demy 18mo, with Illustrations, elegantly bound in cloth.

~~~~~

THIS Series of Books will be found unequalled for genuine interest and value, and it is believed they will be eagerly welcomed by thoughtful children of both sexes. Parents may rest assured that each Volume teaches some noble lesson, or enforces some valuable truth.

1. In the Brave Days of Old ; or, The Story of the Spanish Armada. For Boys and Girls.
2. The Lost Ruby. By the Author of 'The Basket of Flowers,' etc.
3. Leslie Ross ; or, Fond of a Lark. By Charles Bruce.
4. My First and Last Voyage. By Benjamin Clarke.
5. Little Katie : A Fairy Story. By Charles Bruce.
6. Being Afraid. And other Stories for the Young. By CHARLES STUART.
7. The Toll-Keepers. And other Stories for the Young. By BENJAMIN CLARKE.
8. Dick Barford : A Boy who would go down Hill. By CHARLES BRUCE.
9. Joan of Arc ; or, The Story of a Noble Life. Written for Girls.
10. Helen Siddal : A Story for Children. By Ellen Palmer.
11. Mat and Sofie : A Story for Boys and Girls.
12. Peace and War. By the Author of 'The Basket of Flowers,' etc.
13. Perilous Adventures of a French Soldier in Algeria.
14. The Magic Glass ; or, The Secret of Happiness.
15. Hawks' Dene : A Tale for Children. By Katharine E. MAY.
16. Little Maggie. And other Stories. By the Author of 'The Joy of Well-Doing,' etc. etc.
17. The Brother's Legacy ; or, Better than Gold. By M. M. POLLARD.
18. The Little Sisters ; or, Jealousy. And other Stories for the Young. By the Author of 'Little Tales for Tiny Tots,' etc.
19. Kate's New Home. By Cecil Scott, Author of 'Ohrissie Lyle,' etc.

## **Nimmo's Popular Religious Gift Books.\***

18mo, finely printed on toned paper, handsomely bound in cloth extra,  
price 1s. each.

1. **Across the River: Twelve Views of Heaven.** By NORMAN MACLEOD, D.D.; R. W. HAMILTON, D.D.; ROBERT S. CANDLISH, D.D.; JAMES HAMILTON, D.D.; etc. etc.
2. **Emblems of Jesus; or, Illustrations of Emmanuel's Character and Work.**
3. **Life Thoughts of Eminent Christians.**
4. **Comfort for the Desponding; or, Words to Soothe and Cheer Troubled Hearts.**
5. **The Chastening of Love: Words of Consolation for the Christian Mourner.** By JOSEPH PARKER, D.D., Manchester.
6. **The Cedar Christian, and other Practical Papers.** By the Rev. THEODORE L. CUTLER.
7. **Consolation for Christian Mothers Bereaved of Little Children.** By A FRIEND OF MOURNERS.
8. **The Orphan; or, Words of Comfort for the Fatherless and Motherless.**
9. **Gladdening Streams; or, The Waters of the Sanctuary.** A Book for Fragments of Time on each Lord's Day of the Year.
10. **Spirit of the Old Divines.**
11. **Choice Gleanings from Sacred Writers.**
12. **Direction in Prayer; or, The Lord's Prayer Illustrated in a Series of Expositions.** By PETER GRANT, D.D.
13. **Scripture Imagery.** By Peter Grant, D.D., Author of 'Emblems of Jesus,' etc.

### *Fifth Edition.*

In demy 8vo, cloth elegant, richly gilt, price 7s. 6d., or in Turkey morocco antique, 21s.,

**Things a Lady would Like to Know, concerning Domestic Management and Expenditure, arranged for Daily Reference.** By HENRY SOUTHGATE, Author of 'Many Thoughts of Many Minds,' 'Noble Thoughts in Noble Language,' 'Gone Before,' 'The Bridal Bouquet,' etc. etc.

### *Twelfth Thousand.*

In crown 8vo, beautifully bound in cloth extra, full of Engravings and Coloured Pictures, price 3s. 6d., or gilt edges price 4s.,

**Three Hundred Bible Stories and Three Hundred Bible Pictures.** A Pictorial Sunday Book for the Young.

# THE WAVERLEY NOVELS.

ENTIRELY NEW EDITION.

*Crown 8vo, with Frontispiece and Vignette, in elegant wrapper printed in colours, price 1s. each. Also, in Twenty-six volumes, cloth extra, full gilt back, price 2s. per volume; and in Thirteen double volumes, roxburgh style, gilt top, price 3s. 6d. per volume.*

Edited by the Rev. P. HATELY WADDELL, LL.D. With Notes, Biographical and Critical, and a Glossary of Scotch Words and Foreign Phrases for each Novel.

1. Waverley; or, 'Tis Sixty Years Since.'
2. Guy Mannering; or, The Astrologer.
3. The Antiquary.
4. Rob Roy.
5. Old Mortality.
6. The Black Dwarf, and A Legend of Montrose.
7. The Bride of Lammermoor.
8. The Heart of Mid-Lothian.
9. Ivanhoe: A Romance.
10. The Monastery.
11. The Abbot: A Sequel.
12. Kenilworth.
13. The Pirate.
14. The Fortunes of Nigel.
15. Peveril of the Peak.
16. Quentin Durward.
17. St. Ronan's Well.
18. Redgauntlet.
19. The Betrothed.
20. The Talisman: A Tale of the Crusaders.
21. Woodstock; or, The Cavalier.
22. The Fair Maid of Perth; or, St. Valentine's Day.
23. Anne of Geierstein; or, The Maiden of the Mist.
24. Count Robert of Paris.
25. The Surgeon's Daughter, and Castle Dangerous.
26. The Highland Widow, and my Aunt Margaret's Mirror.

With an interesting summarized account of the Scott Centenary.

The above may also be had in substantial half-calf bindings.

**NIMMO'S NATIONAL LIBRARY.**

In crown 8vo, with Steel Frontispiece and Vignette, handsomely bound, cloth extra, price 5s. each ; also in full gilt side, back, and edges, price 6s. each.

**The English Circumnavigators: The most remarkable Voyages round the World by English Sailors.** (Drake, Dampier, Anson, and Cook's Voyages.) With a Preliminary Sketch of their Lives and Discoveries. Edited, with Notes, Maps, etc., by DAVID LAING PURVES and R. COCHRANE.

**The Book of Adventure and Peril. A Record of Heroism and Endurance on Sea and Land.** Compiled and Edited by CHARLES BRUCE, Editor of 'Sea Songs and Ballads,' 'The Birthday Book of Proverbs,' etc.

**The Great Triumphs of Great Men.** Edited by JAMES MASON. Illustrated.

**Great Historical Mutinies, comprising the Story of the Mutiny of the 'Bounty,' the Mutiny at Spithead and the Nore, the Mutinies of the Highland Regiments, and the Indian Mutiny, etc.** Edited by DAVID HERBERT, M.A.

**Famous Historical Scenes from Three Centuries.** Pictures of celebrated events from the Reformation to the end of the French Revolution. Selected from the works of Standard Authors by A. R. HOPE MONCRIEFF.

**The English Explorers ; comprising details of the more famous Travels by Mandeville, Bruce, Park; and Livingstone.** With Map of Africa and Chapter on Arctic Exploration.

**The Book for Every Day; containing an Inexhaustible Store of Amusing and Instructive Articles.** Edited by JAMES MASON.

**The Book of Noble Englishwomen: Lives made Illustrious by Heroism, Goodness, and Great Attainments.** Edited by CHARLES BRUCE.

**A Hundred Wonders of the World in Nature and Art,** described according to the latest Authorities, and profusely Illustrated. Edited by JOHN SMALL, M.A.

**A Book about Travelling, Past and Present.** Profusely Illustrated. Edited by THOMAS A. CROAL.

*Other Popular and Standard Volumes in preparation.*











